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USSR Report

ENERGY

No. 121



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ELECTRIC POWER

CONSTRUCTION PROBLEMS, PROGRESS AT NUCLEAR PLANTS EXAMINED

Moscow STROITEL'NAYA GAZETA in Russian 9 Jul 82 p 1

[Construction report on the Balakov and Zaporozhye nuclear power plants: "The Aim of the Competition is to Repeat Experience"]

[Text] The socialist competition between the construction workers of the Balakov and Zaporozhye AES [nuclear power plant] is bringing tangible results. On this level the Balakov workers are gaining particularly. The Zaporozhye workers began building the plant significantly earlier and of course it is easier for those following along the beaten path.

It is no accident that the construction and installation workers at the Balakov AES, if their work is compared with the same period of last year at the Zaporozhye AES, are ahead of the Ukrainians. This is a natural result of the competition among the collectives which developed in honor of the 60th anniversary of the USSR. The construction workers are constantly exchanging advanced experience, technical specifications and information and all of this helps them work more efficiently.

At the same time, the reserves for such advantageous cooperation are not completely being utilized. Thus, the Balakov workers for some reason did not adopt the experience of the Zaporozhye workers in rapidly creating their own construction industry base, a combine for special structural elements. A delay in its completion date could doom construction directly at the AES also to a delay.

Having sponsored construction at these two major nuclear power projects, we asked Zaporozhye AES workers to share their experience on the newspaper's pages in building such an enterprise with their partners.

But first let us start with a report from Balakov.

Turned into a Slow Project

[Article by the stringer I. Taran]

Vehicles loaded with concrete, preassembled structural elements and reinforcing leave in a constant flow from the piers of the large concrete plant at

Saratovgesstroy [Saratov GES Construction Administration] for the Balakov AES. But it is becoming harder and harder for the veteran to handle these orders. Actually for a long time it has been operating at the limit while the pace at the major nuclear construction project has been constantly growing. One must also not overlook the fact that the equipment at the concrete plant is old and worn out and is not designed to produce elements and parts of the class required by the AES. According to the original plan these were to be produced by a combine for special construction elements, or, as it is sometimes called, the nuclear construction combine.

This unique enterprise in a year will produce 30,000 m³ of reinforced prefabricated concrete and more than 23,000 tons of steel structural elements, 10,000 tons of reinforcing and more than 1,000 m² of special slabs.

But all of this, unfortunately, is still in the future. Over the 2½ years which have passed since the start of construction on the combine, a little more than a quarter of the funds needed for completing it have been used.

Here a significant portion of the blame lies with the designers who systematically failed to meet the dates for providing technical specifications. The general designer, the Odessa affiliate of Orgenergostroy [All-Union Institute for the Designing and Organization of Power Construction] in addition has been greatly delayed in determining the facilities of the combine which are to be completed first.

If one judges from the figures, at present the situation at the construction site has taken a change for the better. The general contractor, the Khimstroy [Chemical Construction] Administration of Saratovgesstroy, overfulfilled the plan for the first quarter and as a whole more has been done on the combine than was planned. Nevertheless, this is less than 10 percent of the annual plan and the construction workers have adopted a clearly understated quota.

The installations to be completed first include the reinforcing shop with a capacity of 10,000 tons of pieces a year and the molding shop designed for 8,000 m³ of prefabricated reinforced concrete. These should be completed in the fourth quarter.

Again the designers have failed. At the end of May they still lacked the complete technical documents for 2.8 million rubles of work. The time has already arrived for installing the nonstandardized equipment. There are 500 units of it but it has not even been ordered, for the designers up to now have not provided the necessary documents.

It was necessary to halt construction in the molding shop. The Donets affiliate was late in submitting the working documents for the foundations under the production equipment.

The first power unit of the Balakov AES should be in operation in 1984. Hence, even now the construction pace must be sharply increased.

[Editorial comment]

The collectives from the subdivisions at the construction administration of the Zaporozhye AES have promised to complete the first power unit of the plant's second stage ahead of time, in 1983. As the course of the work has shown, they are keeping their word.

One of the components for success at Zaporozhye was the completion in 1981 of the first stage of an experimental plant for special structural elements, the sole enterprise of this sort in our nation. Now its collective produces in a year 12,000 tons of special reinforced concrete elements, 10,000 tons of reinforcing elements and 800 tons of inserts. The products from the plant have made it possible to more clearly organize material and technical supply for building the AES and to introduce an across-the-board brigade contract.

The second stage of the plant is actively being built at Energodar. With its completion and upon reaching designed capacity at the enterprise, the labor of its thousand workers will equal the labor of 3,500 persons at the construction site.

Balakhov must repeat and, if possible, add to the experience in developing the construction industry base. For this, their partners in the competition recommend the following.

1. To Concentrate Resources

[By A. Kocherga, chief engineer of the Construction Administration of the Zaporozhye AES]

Even before starting work on the first power unit in the second stage of the Zaporozhye AES, a decision was taken to rapidly erect an experimental plant for special structural materials. For this reason, even at the expense of a temporary harming of basic production, here we focused the basis material, technical and labor resources and here also we began to introduce initially the simple brigade contract and later on the assembly line-complete brigade contract.

What advantages did we gain?

First of all, of course, the accelerated completion of the first stage provided us with a secure rear as now we did not depend upon the suppliers. But, in addition, we actually tested out new methods for organizing labor and these we later, having improved them, employed in building the AES itself.

Our advice to the Balakov workers is to pay more attention to the construction industry base. If it can be so put, the efficient operation of the construction workers at the basic project, the power unit of the AES, will depend upon its workability. We chose precisely such a path.

2. Straighten Out the Designs

[By A. Podgurskiy, chief engineer of the Experimental Plant for Special Structural Elements]

It often happens that a plant is built and then the production processes are worked on for years in order to bring it up to designed capacity. From the very outset we began working in close contact with the designers. The aim was to organize production in such a manner that the basic labor intensive installation operations would be carried out at the plant. For example, we set out to increase the size of the preinstallation elements. While previously, for example, the cylindrical portion of a power unit was made up of many parts, requiring the setting up of thousands of anchor bars, cross and lateral trusses and other parts directly at the site, now all of this is done at the plant. The weight of the unit produced here has risen from 30 tons up to 100 and it can be installed at the site in 12 lifts rather than 98.

Incidentally, I would caution the Balakov workers against using gas torches of the Mikron and Dnepr type in preparing metal edges. Although the designers have proposed them, this equipment does not conform to the technical conditions involved in this operation for the AES. Much more effective and dependable is an edge-planing machine which can handle worked surfaces up to 14 linear meters long.

In addition to close contact with the designers which can help avoid reworking and adjustments at the start of operating the plant, even now it is essential to train personnel for it. Here we are ready to help our partners in the competition. In particular, the workers of the future Balakov Combine even now could undergo practical training at our plant.

3. Let us Compare Forces

[By I. Bashin, electrician from the Experimental Plant for Special Structural Elements]

As is known, both our projects are competing with one another. Contracts for a social competition on both sides have been concluded by the brigades of V. Churilov, N. Derkach, N. Perederiya, N. Shugurin, V. Menzhinskiy and M. Yukhnov and by the Komsomol collectives of I. Kachurovskiy and V. Akel'yev.

But we, the plant workers, have been "dropped out" of this competition. On the one hand, our plant is still young while at Balakov construction has not even been completed. But even now we have definite experience and the collective is being organized at Balakov. It, like we, will endeavor to make a contribution to the overall efforts of the power construction workers and to complete power capacity ahead of time. Here are grounds for competition. It would be a competition when someone merely overtakes someone else but rather a truly socialist one with the exchanging of experience, the transfer of skill and mutual aid. Why don't the Balakov workers visit us, become familiar with our approach to completing production capacity, to improving production methods and overcoming arising difficulties. Then, in starting up the plant, they could avoid and not repeat our mistakes and failings. Hence I say: Let us compete.

[From the Industrial Construction Department]

The first power unit at the Balakov AES is to be in operation in 1984. The start on construction has seemingly not been bad. Obviously one could feel

that the Balakov workers were following the path beaten by the Zaporozhye workers and were skillfully employing their experience. But now, when the time has come to utilize special elements at the project, more and more often there are failures here.

For this reason, the persons involved in building the Balakov AES must listen to the recommendations of their colleagues from the Ukraine. Of course, they must not be satisfied by just those materials which we are publishing today but in actuality, as the electrician N. Bashin proposes, they must go to Energodar, become specifically familiar with the experience acquired here and establish permanent creative ties.

Certainly the main purpose of the competition is not merely a labor rivalry but rather specific mutual aid, the repetition and adding to of experience acquired by the partners.

As a whole even now one can confidently say that the competition between the AES construction workers of the two fraternal republics, in being held during the year of the 60th anniversary of the formation of the USSR, will help them to successfully carry out the responsible tasks.

PHOTO CAPTION

1. The construction workers of the Zaporozhye AES, in worthily celebrating the 60th anniversary of the formation of the USSR, have widely developed a socialist competition. They have resolved to complete the annual construction program for 1982 by 15 November and to begin assembly for the production equipment for the first power unit in the reactor division, 3 months early.

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CSO: 1822/275

ELECTRIC POWER

CONSTRUCTION PROGRESS AT AZERBAIJAN GRES REPORTED

Baku VYSHKA in Russian 6 Aug 82 p 2

[Article by A. Gamedov: "Signs of Growth"]

[Text] Probably no other construction project in the republic has such expressive nicknames as the Azerbaijan GRES. The largest in the Transcaucasus, the power flagship and a testing range for new equipment--all these meaningful and greatly obliging words determine its great economic and social significance.

As its next power units are put into operation, probably new definitions will be found. We feel this is probably inescapable because even its first power unit put into operation last year caused excitement. Each day it generates up to 7 million kilowatt hours of electric power.

There will be four such units. At present, the second is being built. The same high pace has been set in the work as last year. And such an obligation is a responsible one, that is, to complete the unit 3 months ahead of time.

This date is very tough if one takes into account the fewer number of workers, engineers and technicians building the GRES in comparison with last year. But they have a dependable support in the acquired experience. They also have the inspiration which was caused in them by the decisions of the May (1982) Plenum of the CPSU Central Committee aimed at a further rise in the prosperity of the Soviet people. And they are well aware that the implementation of the Food Program will largely depend upon the availability of energy resources. The construction workers are united by one specific aim of putting the second unit into operation at the beginning of October. It is a difficult task. Professionalism, organization and a willingness to search help in carrying it out. The construction workers fulfilled the 7-month quota by 120 percent.

Many leading brigades have developed at the project. One of the Komsomol-youth brigades is headed by the communist Fizuli Mamedov. From his brigade derives the speed-up which can be seen among the construction workers. It set the schedule for building the foundations under the second power unit 6 weeks ahead.

The concreteness and preciseness of the set quota, the clear utilization of equipment in carrying out labor intensive operations, coordination in the actions of the teams and interchangeability--these are the principles which have been followed by the brigade leader F. Mamedov. The camera "caught" him at the

moment when he was giving the next task [the photograph is not reproduced here]. To his left stand the brigade members, the installation worker Yaver Dznabarov, the carpenter Gasan Mansimov and the driller Razmik Avakyan.

Construction has been completed on Azerbaijan's tallest 330-m smokestack. Here the brigades from the Mingechaur section of the Moscow Spetszhelezobetonstroy [Special Reinforced Concrete Construction] Trust distinguished themselves. They have passed on the baton to the installation collective from the Stavropol administration of the Gidrosantekhmortazh [Hydraulic Sanitation-Technical Installation] Trust. They are beginning the giant stack on the inside.

The boiler for the second power unit is being installed by brigades from the Mingechaur administration of the Kavkazenergomontazh [Caucasus Power Installation] Trust.

One of them is headed by the site's veteran A. Aliyev. Initially, as an installation worker from his trust, he worked in Ali-Bayramly, Sumgait, Stavropol, Central Asia and abroad. The Azerbaijan GRES is a project with a future. His stop has been a long one here. He moved his family from Baku to Mingechaur, he was given a good apartment and his children are studying in school. A. Aliyev, for participating in the construction of the GRES, has been awarded the Order of the Red Banner. The distinguished brigade leader has been elected a deputy of the Mingechaur City soviet. The leading construction project has also set an example in solving social problems and in ensuring the health of the workers.

The Azerbaijan GRES is being built comprehensively and behind the front line, the rear in the form of public amenities and works is making equally great progress. On the right bank of the Kura, a town of power construction workers has grown up. It has modern housing with all conveniences.

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ELECTRIC POWER

USE OF SMALL HYDROPOWER PLANTS URGED

Leningrad LENINGRADSKAYA PRAVDA in Russian 28 Jul 82 p 2

[Article by Candidate of Technical Sciences M. Syroyezhin: "The Energy of Small Rivers"]

[Text] Probably at present it would be impossible to find a national economic sector where the specialists in it are not thinking about what contribution they could make to carrying out the decisions of the May Plenum of the CPSU Central Committee and the Five-Year Program adopted by it. Along with everyone, we, the power workers, as well, have begun to carefully analyze the existing reserves closely tied to the development of the agroindustrial complex. We are confronted with the clear task of increasing the power-to-labor ratio in agriculture, bringing electric power output for the countryside in 1990 up to 210-236 billion kilowatt hours. The traditional resources are clearly insufficient for carrying it out.

In addition to the Volga, the Yenisey, Angara and other large water arteries, our nation has 150,000 small rivers, each of which possesses a definite energy resource. For this reason, it is no accident that among the important economic tasks the 26th CPSU Congress posed the task of more fully utilizing the hydropower resources of the small rivers.

I recall that even the GOELRO [State Commission for the Electrification of Russia] Plant considered around 40,000 hydropower units with an average capacity of 13 horsepower and operating on small rivers. At that time they provided a great benefit. During the years of the first five-year plans, simultaneously with the erecting of large power plants, small GES were also built and in the 1950's, for example, their number approached 7,000.

However, later on, in line with the development of the power systems, the branching out of the power transmission lines and the significant increase in the efficiency of the large plants, many of the small GES ceased to exist. Operating expenditures were too high at them and it was not advantageous to retain a large staff here.

Since then, much has changed and primarily the scientific and technical level of Soviet power has risen. The present-day GES possess a high degree of automation. This circumstance now makes it possible to boldly pose the question of resurrecting the network of small GES considering that they could operate under automatic conditions.

A strong argument in favor of such plants is the fact that they could be erected from standardized and hence very economic structural elements and equipment delivered factory-ready to the spot.

First of all, of course, it is essential to use the thousands of mothballed plants which survive throughout the nation. According to the preliminary data of specialists from Lengidroyekt [?Leningrad Design Institute for Hydropower Plants], in the USSR Northwest alone 222 former hydropower installations have been counted, including 38 in Leningrad Oblast. The condition of the Leningrad plants can be seen from the fact that only from 7 of them have the basic installations such as the dams and spillways been destroyed. This means that the reconstruction work would not require large amounts of money.

According to preliminary estimates made by specialists from the Sel'energo-proyekt [Rural Power Design] Institute, the average cost of 1 kilowatt hour from such plants would be 1.2-1.65 kopeck. That is, it would be (considering the money spent on engineering structures and automation) not higher than what is presently characteristic for the medium-sized GES, for example, in the Central Power System. Because of this an opportunity will appear to build them from local financing sources, without centralized capital investments. A small GES will, as they say, be within the reach of even a medium-income kolkhoz or sovkhos and will bring real benefit.

We might recall what is now being used in the countryside as an emergency reserve source of electric power. A diesel or driver, as the people say. For most of the time it sits idle under lock and key. Only when the centralized power supply shuts off or when very urgent situations arise at certain installations (for example, livestock farms) is the lock removed and the diesel "started up." It is more than obvious that its efficiency is extremely low.

We feel that a small GES could be used as such an emergency power source. In the event of necessity it would be switched only to the installations requiring an uninterrupted power supply but on ordinary days it would also operate! An elementary switch would make it possible to have this plant be a universal one.

At present, specialists from Lengidroyekt are creating a general plan for the development of the nation's power resources. Research on the reserves of the small rivers has become one of the areas of this work. Naturally, this work is rather labor-intensive (even for our oblast) and, in our view, it would be advisable to involve additional forces in it such as Lengiprovdokhoz [?Leningrad Design Institute for Land Reclamation and Water Resources] which, incidentally, in one way or another later on must take part in detailing the design ideas of Sel'energo-proyekt. Secondly, we must move from individual plans to standard ones, that is, to the standard designing of automatically operating power units and standard designing of equipment for the integrated water developments and the GES.

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ELECTRIC POWER

USE OF FUEL CELLS IN POWER GENERATING DESCRIBED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 19 Aug 82 p 2

[Article by Doctor of Chemical Sciences Yu. Chirkov: "The Heat of Cold Burning"]

[Text] In front of me was a diagram of a power plant. At first glance it was the most ordinary with a steam generator, turbines and electric generator....

"The similarity is deceptive," said the deputy director of the State Scientific Research Energy Institute (ENIN), Doctor of Technical Sciences, Prof R. Akhmedov. "Just look: here the coal is not burned immediately, but rather goes into the gas generator as dust. In it, under the effect of oxygen and water vapor, the fuel gases are formed. Then they are used as the fuel for our power plant...."

"But what is the reason for this? Certainly much heat must be spent to convert the coal into gases. In other words, the same energy which the customers are expecting from the plant...."

"It is more than compensated by this truly unusual unit for power plants," said Rustam Berovich [Akhmedov], smiling. "This is a unit of fuel cells...."

The word "burning" scarcely permits different interpretations: both in a bonfire and in the furnace of power plants, flows of heat and high temperatures are related to it. But there is a special "cold" burning without heat and without high temperatures. For example, this occurs in a flashlight battery. And as a result we obtain the sought after electric current.

A fuel cell is essentially the same battery. But while in a battery the reserves of chemical agents are limited, in a fuel cell the fuel and oxidizing agent, for example, hydrogen and oxygen, can be continuously delivered. And immediately, without wasteful conversion into heat, electric power can be obtained.

The advantages of such a process are enormous. Just judge for yourself. In "purely" thermal power plants the efficiency averages 33.4 percent. In other words, two-thirds of the fuel secured by hard labor is simply lost in warming the atmosphere. But in a fuel cell, efficiency can reach 80-85 percent!

Electrochemical energy which is based upon "cold" burning appeared many years ago.

But at that time coal and steam still prevailed in technology. In the first appearing thermal power plants the efficiency scarcely reached 10 percent. Against this background, the advantages of fuel cells, regardless of their capriciousness and imperfection, appeared indisputable. But still power engineering followed a different path. "Big oil" arrived and this resolved many problems.

But at present oil is becoming more and more expensive and its deposits are rapidly being depleted. What can be done? Reconvert to coal, the reserves of which are sufficiently great? But concern for protecting the environment argues against such a solution.

"For this reason, we became interested in fuel cells," continued R. Akhmedov. "Due to them, an opportunity has appeared to kill three birds at once: to return to coal, to make coal-based energy sufficiently economic and at the same time ecologically clean as the electrochemical 'combustion' of hydrogen and oxygen produces only water...."

The coworkers of the ENIN worked out the plans for the unusual power plant in cooperation with researchers at the Kvant [Quantum] NPO [Scientific-Production Association], where, under the leadership of the Corresponding Member of the USSR Academy of Sciences N. Lidorenko and Doctor of Technical Sciences, Prof G. Muchnik, different variations of the fuel cells have been and are being developed.

It has turned out that even now, without waiting for the appearance of new, more advanced cells with molten and solid electrolytes, it would be possible to develop a power plant with an efficiency 5-10 percent higher than in the best TES. Here it would be possible to provide a savings of up to 20-25 percent of the fuel for each produced kilowatt hour. Also ordinary thermal engineering equipment could be employed in the thermal system of such a power plant. Also the plant could be located directly next to the consumers, even within the city limits, reducing expenditures on energy transmission and distribution.

Attempts to develop power plants based on fuel cells have also been undertaken abroad in the United States and Japan. In particular, in the plans of a plant for New York, the design of the fuel cell unit has been originally solved. Each of them is a sandwich, where two porous electrodes play the role of pieces of bread and between which is sandwiched a porous matrix saturated with a solution of phosphoric acid electrolyte. The thickness of such a "sandwich" is millimeters while the capacity is hundreds of watts. Understandably, this is too small for the operation of a power plant. For this reason, in the plans 460 electrochemical "sandwiches" have been combined into 20 modules or "columns" with a capacity of 200-500 kilowatts each.

"In the American plans, oil or natural gas is used as the fuel," stated R. Akhmedov. "For this reason, the obtained electric power will be rather expensive, on the order of 1,500 dollars per kilowatt. Such a unit is suitable for testing out the principle. But no more. We have immediately set out to use coal and 'large power' at a station with a capacity from 500 to 3,000 megawatts.

The scientists have based the plans on the main principle that the appearance of the plant should be determined by the fuel cell units as these are the most effective in the sense of converting the energy but are also still the most expensive part. Fuel cells with acid and alkali electrolytes and with melts or fusions were studied as variations. Each of them substantially altered the entire energy design of the plant.

"Unfortunately, the fuel cells still are unable to 'feed' directly on the coal," continued the scientists. "They prefer as fuel gases, particularly hydrogen. For this reason, there is a gas generator in the plan of our station. But the energy which must be consumed here we intend to virtually fully recover. How? The synthesis gas is obtained at temperatures of 1,500-1,600°. Hence, it possesses not only chemical but also great thermal energy. We want to 'put to work' a significant portion of it using steam and gas turbines. And after them the gas will be channeled into the fuel cells. This 'cascaded' method also makes it possible to obtain the desired performance of the plant...."

In the calculations, as the initial raw materials they have used the coals from the Irsha-Borodin mine near Krasnoyarsk. In the future it is a question of utilizing the brown coals from the Kansk-Achinsk Thermal Power Complex which possess a high ash content and a low heating capacity. But wherever the new type of plants begin operating, the first and possibly the most important step has been taken as the ENIN coworkers have demonstrated the fundamental possibility of developing economic power plants operating on fuel cells.

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CSO: 1822/274

ELECTRIC POWER

GREATER ROLE FOR HEAT PUMPS IN GEORGIAN POWER URGED

Tbilisi ZARYA VOSTOKA in Russian 17 Jul 82 p 2

[Article by Vakhtang Gomelauri, chairman of the Scientific Council for Energy Problems under the Georgian Academy of Sciences and Academician of the Georgian Academy of Sciences: "The Future of Power"]

[Text] The constant broadening and strengthening of the entire power supply system is a major condition for the intensive development of the national economy, for the growth of labor productivity and for raising the standard of living of the population. The 6th Plenum of the GCP [Georgian Communist Party] Central Committee devoted exceptionally serious attention to the problems of developing the republic's energy and to the questions of improving the fuel and energy complex on the basis of the wide use of achievements in modern science and technology.

Corresponding analysis has shown that the total amount of electric power required in a comparatively large region, for example, in the entire republic, consists of a portion consumed evenly over time and a portion which shows abrupt changes over the day. Because of this the electric power system which supplies electric power for the consumers should include power plants having an opportunity of generating electric power evenly over the day and during the year as well as power plants adopted for operating with sharply changing capacity. The designated electric plants are correspondingly termed the base power plants and the power plants designed to cover the peak and semipeak (variable) power loads. Of essential significance is the circumstance that, as a rule, the base electric power comprises over 60 percent of the total amount of electric power consumed in the region. For example, according to a study by the leading scientific research, planning and design organizations, in 1990, the demand for basic and peak and semipeak electric power in Georgia will be, respectively, around 15 and 9 billion kilowatt hours.

In world power practices, the development of electric plants which cover the variable electric loads, that is, operate with sharply changing capacity, has been a difficult problem, however under the conditions of Georgia which possesses significant hydropower resources, the solution to this problem does not represent any fundamental technical difficulties. Suffice it to say that the further planned construction of large hydropower plants possessing sufficiently large reservoirs on our basic water arteries, primarily the Inguri and Rioni Rivers, can fully cover the variable electric loads in the power system both up

to the end of the present century and beyond it. These GES will also be able to participate in covering the peak loads of the neighboring power systems and this will substantially help in creating normal operating conditions for the entire unified power system of the Transcaucasus. In this regard, the question of building the so-called pumped storage hydropower plant [GAES] in Georgia merits serious attention.

Over the last decade in the area of developing the Georgian power system, regardless of the starting up of the unique Inguri GES, there has been a significant lag as a consequence of which during the autumn-winter months in the republic there has been a constantly growing shortage of electric power creating serious difficulties in power supply for the consumers. The development of the shortage has been caused by the fact that since 1971, the capacity of the base power plants has virtually not been increased in the Georgian power system. Precisely because of this the above-designated shortage as a whole has occurred in base electric power. According to the studies made, in 1990, the shortage of base electric power in the Georgian power system during the period of the autumn-winter maximum of power loads will be around 5 billion kilowatt hours, that is, approximately one-half of the base electric power consumed over this period. Of essential significance is the circumstance that the designated shortage of base electric power will occur under the conditions of a shortage of base electric power in the neighboring power systems as well.

On the question of eliminating the growing shortage of base electric power in the Georgian power system, the 6th Plenum of the GCP Central Committee emphasized that the solely correct solution, and this has been demonstrated by an objective evaluation, is the construction of a major base power plant in the republic. Obviously, the solution to this problem requires the building of a large-capacity TES or AES in Georgia and the advantage, from the viewpoint of a cleaner source of electric power which does not pollute the environment is on the side of the AES.

This viewpoint is shared by a majority of the leading power engineers and physicists in the republic as well as specialists from other areas.

The 6th Plenum of the GCP Central Committee devoted attention to the existing lag in the area of introducing heat pumps the wide use of which undoubtedly will make it possible to have a substantial contribution to improving the fuel and energy complex in the republic.

Among the various low-temperature production processes, of the greatest interest under Georgian conditions is the use of heat pumps in the tea industry which is here one of the leading national economic sectors. As is known, the tea factories each year consume over 100,000 tons of high-grade mazut. This entire quantity of liquid fuel is consumed on heating atmospheric air delivered to the tea drying and tea curing units to 50-100° C, after which this moisture-saturated air at a temperature of 30-60° C, along with the heat contained in it is released into the atmosphere. The recovery of this heat using a heat pump would completely exclude the need to burn mazut at the tea factories. The use of heat pumps requires the expenditure of electric power, however, the total capacity needed for all the heat pumps at the republic tea factories is a minimum of 180,000 kilowatts and this is less than the capacity of just one unit at

the Inguri GES. Here, since the tea factories do not operate during the low water period, that is, from November through April, the heat pumps of these factories, making it possible to save 100,000 tons of high-grade liquid fuel annually, will at the same time be a regulating consumer for the surplus seasonal electric power which is so essential for the Georgian power system. One should also note that the heat pumps, in contrast to the uneconomic and primitive mazut burners, can ensure the precise observance of optimum air heating temperatures as provided by the current production standards. These make it possible to maintain a comfortable air temperature in the factory shops and virtually completely exclude the danger of the outbreak of fires here.

Also important is the fact that the conversion of a tea factory to heat-pump heat supply envisages the setting up of cold storage lockers at the factory and these would be used for the green tea leaf delivered during the peak harvest period. The locker, in utilizing the waste cold from the heat pump, would make it possible, so to speak, to "smooth out" the peak loads. Due to this factory productivity could be increased by 25-30 percent. Thus, the conversion of three or four tea factories to heat-pump heat supply would be the equivalent of building a new factory.

Regardless of the designated advantages and the presence of design and estimate documents which have been excellently executed by Gruzgipropishcheprom [?Georgian Design Institute for the Food Industry], the prototype heat pump unit still has not been completed at the Samtredia Tea Factory. Incidentally, the plans envisage the installation at the plant of serially-produced Soviet-made refrigeration compressors which operate on cooling agents produced in our nation. Thus, the directive instructions and decisions of the superior Georgian bodies on the given question remain unfulfilled, and in particular, the points which envisage the creation of the prototype heat pump units. Designed by Gruzgiprogostroy [?Georgian Design Institute for Urban Construction] and designed for heat supply at resort facilities on the Black Sea coast and in the town of Tskhaltubo. As the reasons which have caused the delay in converting to heat-pump heat supply, for example, at the Samtredia Tea Factory, usually such arguments are given as the difficulty of operating the refrigeration compressors, the lack of refrigeration specialists and so forth. Along with this it is known that the refrigeration compressors are being successfully operated at many republican enterprises and at Samtredia itself at the non-alcoholic beverages plant. It is also known that refrigeration compressor operators can be trained on the spot within a 3-month period by Orgpishcheprom [?Organization for the Scientific Organization of Labor, Introduction of New Equipment and Advanced Experience for the Food Industry]. As for refrigeration engineers, each year they are graduated by the mechanics and machine building faculty of the Georgian Polytechnical Institute imeni V. I. Lenin. In this regard of essential significance is also the fact that the creation in the republic of heat-pump heat supply systems has been provided with scientific and technical leadership from the sectorial laboratory for heat pump units organized under the Georgian Polytechnical Institute imeni V. I. Lenin.

There is no doubt that the decisions of the 6th Plenum of the GCP Central Committee will play a crucial role in optimizing the structure of the Georgian power system and further improving the republic's fuel and energy complex.

ELECTRIC POWER

BRIEFS

NEW CONSTRUCTION CRANE--The method of large-unit installation is helping to increase labor productivity and shorten construction time. In building the AES, the introduction of this method is being aided by a new gantry crane with a lifting capacity of 200 tons, a span of 80 m and a lifting height of 76 m. This crane was developed by specialists from the Kharkov affiliate of the Energomontazhproyekt [?Power Installation Design] Institute. This lift will be used for the first time in installing the power units of the Balakov AES. [By G. Genshaft, engineer-economist from Kharkov] [Text] [Kiev PRAVDA UKRAINY in Russian 17 Jun 82 p 2] 10272

GEORGIAN POWER CONSTRUCTION--Regardless of the floods and the heavy torrential rains with hail, the construction workers on the Khudonskaya GES are ahead of schedule. Yesterday they began cutting the diversion tunnel for shifting the Inguri River to its new channel. Its construction will make it possible to begin erecting the arch dam 190 m tall. The project is a complicated one and for this reason powerful equipment has been brought to the site and experienced hydropower construction workers have arrived here. The basic work has been assigned to the leading brigade of K. Markhuliya. It has been aided in the experience acquired in cutting the 15-km penstock at the Inguri GES. In the collective everyone has mastered related professions and this will make it possible to significantly accelerate the cutting and raise labor productivity. The Khudonskaya GES with a capacity of 750,000 kilowatts each year will generate 1.7 billion kilowatt hours of electric power. The hydropower plant will accelerate the development of the productive forces in Svanetia. [By TASS from Mestia, Georgia] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 9 Jul 82 p 1] 10272

ANGARA HEATING LINE--Construction has been completed on a thermal pipeline across the Angara. Of the 13 km of large-diameter thermal network, more than 1.5 km runs across the river. Now the hot water from the Novo-Irkutskaya TETs will be delivered to the houses of inhabitants on the right-bank rayons of the oblast center and will make it possible to eliminate hundreds of small boiler installations. Recently the act was signed accepting the line for operation. Now the construction workers are preparing to build a second stage for the line. It will supply water to Akademgorodok on the left bank of the Angara. [By L. Babin from Irkutsk] [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 1 Aug 82 p 1] 10272

NEW HYDROPOWER UNIT--Naberezhnyye Chelny (Tatar ASSR). The 10th unit of the Nizhnekamskaya GES has gone on line. It has delivered current to the nation's unified power system. The high level of plant prefabrication for the assemblies and the progressive method of large-modular assembly made it possible for the installation workers from the Spetsgidroenergomontazh [Special Hydropower Installation] Trust carry out the work under a concentrated schedule. In endeavoring to quickly achieve the final result, the specialized brigade of S. Slabenko, having effectively completed the assembly of the stator, helped rivals in the competition in installing another unit. The construction of the GES is continuing. [Text] [Yerevan KOMMUNIST in Russian 20 Jul 82 p 1] 10272

MAYNSKAYA GES RESEARCH--The Institute for Hydraulic Engineering imeni B. Ye. Vedeneyev is continuing research on the development of the Maynskaya GES. This power plant is a satellite of the Sayano-Shushenskaya giant power installation. It will have a capacity of just 320,000 kilowatts. Its basic purpose is to control the level of the Yenisey. One of the basic parts of the dam, the spillway, is being tested on a vacuum-cavitation stand at the integrated hydraulics laboratory. The recommendations by the scientists will provide an opportunity for the designers and builders to create a maximum dependable structure. In the photograph (not reproduced): Technician N. P. Tokmakova and Engineer I. Yu. Gorshenina watch the testing of the model of the spillway at the Maynskaya GES. [Text] [Leningrad LENINGRADSKAYA PRAVDA in Russian 14 Jul 82 p 1] 10272

KHARANOR GRES CONSTRUCTION--A Komsomol-youth brigade of carpenter concrete workers of Aleksandr Burdinskiy has appealed to all the young construction workers of the Kharanor GRES and the town of Yasnogorsk being built together with it to develop a socialist competition to complete the first units of the power plant in 1984. This patriotic initiative was approved by an open Komsomol meeting at the site and by the Chita CPSU obkom. The results of the competition are to be given for three categories of participants: among the equipment operators, the workers of the general construction specialties and engineer-technical personnel. The young Yasnogorsk workers have marked the start of the competition by laying out the Park imeni XIX s'yezd VLKSM [Komsomol]. They have set the task of completing construction-installation work valued at 14 million rubles this year for ensuring the starting-up of the first units at the designated date and in the future year will double the amount of this work. [By A. Prigodich] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 11 Jul 82 p 2] 10272

PERM GRES CONSTRUCTION--Near the town of Dobryanka on the Kama River, the nation's largest Perm GRES is being built. A collective of construction workers from the Permgresstroy [Perm GRES Construction] Administration is working intensively to build the basic installations. The first power units at the plant should be on-line by the end of next year. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 16 Jul 82 p 1] 10272

DNESTR GES CONSTRUCTION--The operating two units of the Dnestr GES have produced the first quarter-billion kilowatt hours of electric power. The power workers dedicated their success to the 60th anniversary of the formation of the USSR. The installation workers are preparing to start up the third unit. Work on the fourth unit is also ahead of schedule. Here they are carrying out the

responsible operation of lowering a multi-ton impeller into the prepared crater. [By V. Volodin from Chernovtsy Oblast] [Text] [Moscow IZVESTIYA in Russian 30 Jul 82 p 2] 10272

PAPANSKIY HYDROPOWER PROJECT--In the construction of the Papanskiy Integrated Hydropower Development work has started on filling the second stage of the dam. Having joined the competition to properly celebrate the 60th anniversary of the USSR, the collective of the PMK [mobile mechanized column] from the Naryngidroenergostroy [Naryn Hydropower Construction] Administration annually [sic] lays around 3,000 m³ of rock in the dam's body, and this is one-third above the norm. The competition between the related excavator, transport and bulldozer operators has been organized according to the "Worker Relay" principle. Having concluded a contract on labor collaboration, they have made the end result the chief indicator of their work. By the nation's jubilee, they plan to complete the second stage of the dam, bringing its height up to 80 m. Along with the earth fill, the tower of the water outlet is rapidly growing, and the transport tunnel has been cut a half kilometer into the rock. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 11 Jul 82 p 2] 10272

CAUCASUS POWER LINE--A 200-km 500-kilovolt power transmission line is now in operation. It runs between the Stavropol GRES and the Central Substation in Apsheronskiy Rayon of Krasnodar Kray. This line will ensure dependable power supply for the industrial centers and agricultural regions of the Black Sea area. A 500-kilovolt power transmission line is also being built from the Stavropol GRES across the glaciers of the Main Caucasus Range and it will connect this thermal plant with the Inguri GES. By the end of the summer, there are plans to complete the installation of supports on the most difficult section of the route, the Makhar Pass, which is almost 3,000 m above sea level. [Text] [Moscow PRAVDA 12 Aug 82 p 3] 10272

PAPANSKIY CONSTRUCTION PROGRESS--The filling of the second stage of the dam has started in the construction of the Papanskiy integrated power development in Kirghizia. Having joined the competition to properly celebrate the 60th anniversary of the USSR, the collective of the PMK from the Naryngidroenergostroy Administration each day is laying around 3,000 m³ of rock in the dam's body and this is one-third above the norm. In the photograph [not reproduced] powerful excavators, bulldozers and dump trucks are at work building the dam. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 25 Jul 82 p 3] 10272

SULAK POWER DEVELOPMENT--Scores of rivers carry their waters from the sparkling icy caps of the Main Caucasus Range across the valleys of Dagestan to the Caspian. The mightiest and probably the most beautiful of them is the Sulak. Since antiquity it has been called a dragon river. Its enormous hydropower potential was wasted. Only under Soviet power did man begin to conquer the Sulak and its tributaries. The first to be built was the small Gerbegil GES and then the Chir'yurt. But the largest in the series of plants will be the Chirkey. It has already been put into permanent industrial operation. The plant is built in a narrow and deep mountain gorge, in areas where high seismic activity has been noted. The basic structures have been designed on a high scientific and technical level. A collective of the developers and builders have been proposed for prizes of our nation's government. "The entire nation

erected the plant," related the brigade leader of the multi-specialty brigade of Chirkeygesstroy [Chirkey GES Construction], Omar Aliyev. "Representatives from virtually all the republics, krays and oblasts arrived in Dagestan. On the banks of the Sulak, an international working family developed and grew stronger through joint labor. Let me give just the following fact. During the time of the dam's construction, more than 3,000 workers and technicians were trained and they were the sons and daughters of many nationalities of Dagestan." No, at present the Sulak gives not only electricity. The Chirkey integrated water project makes it possible to comprehensively solve the problems of energy, irrigation and water supply for the republic's towns and settlements. Recently construction was completed on the 75-km irrigation canal imeni Oktyabr'skaya Revolyutsiya and the Verkhne-Khasav'yurt Canal has been cut. At present 300,000 hectares of arid lands are being irrigated in the mountainous region. In addition to the plant itself, the hydropower construction workers have built and are continuing to build industrial enterprises, cultural-service facilities and housing in the republic's towns and villages. For example, the fine settlement of Dubki has grown up. Roads, large plants and a gas pipeline have been built. [By PRAVDA correspondent V. Artemenko from Dagestan] [Text] [Moscow PRAVDA in Russian 17 Jul 82 p 1] 10272

MAGADAN POWER LINE--The openwork supports of a new 220-kilovolt power transmission line have marched across the Tayga and Hillocks. This power bridge over the Tayga stretching almost 300 km, links the Arkagala GRES and then the Kolyma GRES with the "Pole of Cold," Oymyakonskiy Rayon in Yakutia. This will make it possible to improve power supply for the ore-mining industry of Magadan Oblast and the Yakutsk ASSR. The construction workers of the new power transmission line must quickly cross scores of northern rivers, the spurs of the Cherskiy Range and swamps. At present, more than 100 metal supports have been placed on concrete foundations and the wires have been strung on the first 20-km section of the difficult route. Ariators are helping the installation workers storm the mountain passes. MI-7 helicopters are being used to deliver the multi-ton supports to areas inaccessible for motor transport, that is, on the slopes of the steep mud cones and the abrupt river banks. The building of the new high-voltage line is a component part in the comprehensive program for developing the productive forces of Magadan Oblast in this five-year plan. In particular, there are plans to more fully utilize the energy from the northern rivers in the Kolyma and Chukotka, as well as create new energy capacity on the basis of the local coal deposits. This will make it possible to sharply reduce the number of small departmental power plants of which there are more than a thousand now on the oblast's territory. [By G. Krasnogor, TASS correspondent, from Magadan] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 May 82 p 2] 10272

NIZHNEKAMSKAYA GES CONSTRUCTION--The fifth unit of the Nizhnekamsk GES has gone on line. Yesterday it began providing current for the Unified Power System of the nation. The high level of plant prefabrication for the equipment and the progressive method of large modular assembly have made it possible for the installation workers from the Spetsgidroenergmontazh Trust carry out the work under a concentrated schedule. [By TASS from Naberezhnyye Chelny] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 4 Jul 82 p 1] 10272

KOLA AES CONSTRUCTION--Murmansk Oblast. At the end of June 1982, the Kola AES will be 10 years old. Further construction of the AES is also successfully being continued. A socialist competition to properly celebrate the 60th anniversary of the formation of the USSR has been widely developed in building the next power unit. [Text] [Source not given] 10272

BAYPAZIN GES CONSTRUCTION--The site of the Baypazin GES under construction, the next plant on the Vakhsh series, has begun ahead of time to receive parts of hydropower equipment from the Kharkov Turbine Plant. Suppliers from Sverdlovsk, Zaporozhye and Krasnoyarsk have informed their distant friends in the "Worker Relay" from the Nurekgesstroy [Nurek GES Construction Administration] that they will fulfill the orders ahead of time for the nearly-completed project. [By A. Ikramov] [Text] [Source not given] 10272

PORTABLE THUNDER ALARM--A device warning of a thunderstorm danger will become a valuable assistant for construction and repair workers on power transmission lines. This unit was developed by specialists from the Scientific Research Institute for Power imeni I. G. Yes'man. The compact and portable instrument picks up the electromagnetic radiation arising with a thunder discharge at a distance up to 40 km. The unit is to go into serial production at the Azenergonaladka [Azerbaijan Power Installation] Association. Here a warning sound signal is emitted indicating that for now work on the line need not be halted and possibly the storm will pass to the side. A second signal means that the thunder is approaching while the third means that work must be halted. The device is also usable by the controllers of power transmission lines. In precisely determining the movement of thunder clouds, they can promptly shut down the lines on distant sections. [By Azerinform] [Text] [Baku VYSHKA in Russian 26 Jun 82 p 4] 10272

SPANDARYAN GES CONSTRUCTION--High in the Zangezur Mountains, Armenian hydropower construction workers are erecting the last stage of the Vorotan Hydropower Series, the Spandaryan GES. Having set the shock watch in honor of the 60th anniversary of the formation of the USSR, construction workers from the Armgidroenergostroy [Armenian Hydropower Construction] Trust are ahead of schedule in the construction-installation work. In endeavoring to complete the construction of the unique plant ahead of time, the hydropower construction workers have resolved to complete the construction of all the projects at the plant a month ahead of time. [By N. Ordinyan from Sisian] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 26 Jun 82 p 1] 10272

NEW RESEARCH REACTOR--Dubna (Moscow Oblast), 5 June (TASS). The scientists at the Joint Nuclear Research Institute [OIIYaI] have received a new unit, a powerful pulse fast reactor, the IBR-2. This was announced at the session ending today of the Scientific Council of the OIIYaI. This meeting was attended by physicists from 11 socialist nations which are participants of this international scientific center. The director of the OIIYaI, Academician N. Bogolyubov, pointed out that the reactor has world-record parameters of neutron flows. This opens up broad opportunities for the physicists of the socialist nations to study the structure of atomic nuclei and the properties of elementary particles. [Text] [Leningrad LENINGRADSKAYA PRAVDA in Russian 6 Jun 82 p 1] 10272

FAR EASTERN POWER--Our nation is carrying out a major program for hydropower construction in the eastern regions. Recently on the Zeya River, a tributary of the Amur, a hydropower plant was put into operation with a capacity of 1.3 million kilowatts. Now, on another tributary of the Amur, the Bureya, construction is starting on a new GES. The Bureya GES is a characteristic example of construction in the Far East. Here all projects are a natural continuation of one another and the scale of each subsequent project significantly exceeds the parameters of its predecessor. This is also the case of the Bureya GES. Its six units (a total capacity of 2 million kilowatts) will produce over 7 billion kilowatt hours of electric power a year. Soon construction will start on still another GES on the Bureya, the Nizhnyaya Bureya [Lower Bureya]. In contrast to other hydropower series, the two plants on the Bureya will be built simultaneously. This is caused not only by the need of the Far Eastern Region for electric power and the advantages of a common construction base. Both hydropower plants will make maximum use of the river's resources. In receiving the overflow from the Bureya GES, the Nizhnyaya Bureya will make it possible for the first plant to operate at full capacity and will not allow flooding of surrounding settlements. The time has long passed when the starting of major construction involved many domestic inconveniences for construction workers. On the bank of the Bureya, now next to wooden huts, 5-story buildings are going up. This is the settlement for hydropower construction workers, Talakan. More than 500 plants of the nation participated in the construction of the Zeya GES. In particular, enterprises from the RSFSR delivered rolled metals, pipe, cement, turbines and hydropower generators to the project. Ukraine supplied transformers and Belorussia provided large-capacity trucks. Kazakhstan sent metal structural elements. The entire nation will also build the Bureya GES. At the start of the 12th Five-Year Plan, power from the new GES will flow into the Unified Far Eastern System of Power Transmission Lines. This will make it possible to improve power supply to the cities of Blagoveshchensk, Khabarovsk and Komsomolsk-na-Amure. One of the basic consumers of power will be the Baykal-Amur Mainline and the new enterprises built in its zone. Moreover, the dams on the Bureya will free many hundreds of thousands of hectares of fertile Far Eastern lands from flooding. [By O. Kvyaskovskiy] [Text] [Yerevan KOMMUNIST in Russian 10 Aug 82 p 1] 10272

KARAKUM CONSTRUCTION PROBLEMS--The letter by V. Prokhorov from Sverdlovsk raised the questions: "Is construction on the Karakum Canal to be continued? Are there difficulties and unsolved problems?" The article "Ever-Farther into the Karakums" (28 Aug 80) was devoted precisely to the questions which are awaiting their resolution. The replies then received from Turkmenia requested that the editors continue to monitor the course of this construction project. In particular, it was said that power transmission lines to the construction zone of the Zeid Reservoir were being put up slowly. In line with this rear request, criticism was voiced of the Minenergo [Ministry of Power and Electrification], ("Today on the Karakum River" 3 Feb 82). The Chief of the Main Production Technical Administration for Construction of the Minenergo, G. Iyevlev, informed the editors: "The 1982 plan for power supply for the zone of the Zeid Reservoir includes construction and completion of the following: a 110-kilovolt power transmission line between Zakhmet-Niyaz some 195 km long; a 110-kilovolt power transmission line between Karamet-Niyaz and Premzona some 53 km long. Control has been established over the course of construction on the power supply projects in the construction zone of the Zeid Reservoir." This is extremely necessary,

In fact, everything turns out to be not so good. While the first line is being built normally, the second has not been started at all, although they should have started long ago. This is the task of Turkmenglavenergo [Main Turkmen Power Administration]. However, it asked Glavkarakumstroy [Main Karakum Construction Administration] to help in setting up the reinforced concrete supports. The Karakum construction workers agreed although this was not their job. But so far Turkmenglavenergo has not provided a single support. It may be assumed that these finally will appear and the idled powerful electric dredges will receive their current. [Text] [Moscow PRAVDA in Russian 25 Jul 82 p 3] 10272

SLOW GRES CONSTRUCTION--Dear Editors! Twice, on 25 September 1978 ("idling") and 19 March 1979 ("the installation is being dragged out"), PRAVDA wrote about the unjustifiably delayed construction of a power plant in the settlement of Dedovichy in Pskov Oblast. We, the authors of this letter, work here and for this reason are well aware of the state of affairs. The plant has been under construction since 1970, the total volume of work is 113 million rubles but here not more than 2 million rubles are used a year. The First Deputy Minister of Power and Electrification P. Falaleyev, in replying to the criticism in the newspaper, then informed the editors that the ministry "was taking measures to strengthen the construction organization and provide it with the necessary equipment and material resources so that the first power unit would be in operation in 1981." After the criticism in PRAVDA, at a session of the collegium of the USSR Minenergo [Ministry of Power and Electrification], the course of construction at the Pskov GRES was taken up. The completion of the first power unit was planned for 1984. At present, it is obvious that this date will not be met. It is essential to complete at least 10 million rubles worth of work a year and this is 5-fold more than the achieved limit at the GRES site. In addition to this are the corrections made into the technical plans for completing the first unit, requiring 14 million rubles of additional work. Regardless of the orders, the construction project as before is poorly supplied with materials. For example, last year due to the lack of reinforcing steel, work was halted on the smokestack. For a long time there has been no work on the water system, the treatment works and the unloading facilities as there was no cement and crushed rock. People have lost confidence in success and are leaving the project. The communists have repeatedly discussed all of this at meetings and have written letters to the USSR Minenergo and the Pskov Party Obkom. But no precise answer has been received to the questions concerning the labor collective. We would like to know if things will finally get off dead center? [By V. Kuchumova, deputy secretary from the party organization of the construction administration of the Pskov GRES and I. Pavlov, chairman of the people's control group from the village of Dedovichy, Pskov Oblast] [Text] [Moscow PRAVDA in Russian 25 Aug 82 p 3] 10272

NEW POWER SOURCES--Recently, specialists have been drawn to nontraditional methods of obtaining industry. Some of them have been demonstrated at the Elektro-82 Exhibit. The Malakhit-6 electrochemical generator transforms the thermal energy formed as a result of the reaction of the oxidation of hydrogen by the oxygen in the surrounding air into electrical. It can be employed for

supplying power to communications and equipment in areas remote from stationary electric power sources. The SVU-80 solar water lift is designed for water supply on pastures in the arid and desert regions of the nation. The main element of this unit is solar batteries by which the energy of solar radiation is transformed into electricity. The Sever (North) thermoelectric generator operates dependably in inaccessible and little-developed areas of the Far North, in warming the tents of reindeer herders, the huts of geologists and other living quarters. The generator operates on a liquid (kerosene or gasoline) and gaseous fuel. It receives electric power with the aid of semiconductor thermoelectric batteries by economically burning the fuel. [Prepared by A. Lupenko and V. Kharlamov] [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 29 Jul 82 p 1] 10272

WIND-POWERED EQUIPMENT --The marine meteorological station of Melkovodnaya in Tauyskaya Guba in the Sea of Okhotsk has received the first wind-driven power unit from those which are presently produced by Soviet industry. Winds are frequent in this area. In using their force, the new unit to a significant degree will replace the operation of the diesel generator and will make it possible to save fuel and energy resources which are shipped in here. The generated power should operate the radios and employed for illumination and domestic needs. The calculated capacity of the unit is 6 kilowatts. In the near future a windmill for northeasterlies will be installed by a brigade of specialists from the Kolyma Administration for Hydrometeorology and Environmental Monitoring. [By Zh. Yeremenko from Magadan] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Aug 82 p 2] 10272

TURBINE MODERNIZATION PROPOSALS--The capacity of hydropower plants [GES] on mountain rivers can be significantly increased by modernizing their turbines as proposed by Kharkov scientists and production workers in collaboration with specialists from Moscow. The Plant imeni S. M. Kirov has completed the manufacturing of a set of assemblies for reequipping the first unit of the Nurek GES in Tajikistan. "As a result of experiments, an effective method has been found for reducing turbine vibration and which prevents achieving their maximum output," stated the professor at the Kharkov Polytechnical Institute, D. Aleksopol'skiy. "A compact device has been developed which eliminates pulsations in the water current. The equipping of the turbines in Nurek with such a device is the equivalent of completing a power unit with a capacity of 300,000 kilowatts and costs scores of times less. The Ukrainian machine builders and power workers from Tajikistan have resolved to put the first of the plant's rebuilt units in operation by the 60th anniversary of the formation of the USSR. By the end of the Five-Year Plan, using an accelerated work schedule, all the plant's units will be converted. According to the calculations of specialists, turbine modernization will provide a major effect at other large GES in the south of the nation such as the Inguri in Georgia and the Chirkey in Dagestan. The new technical ideas are now being incorporated in the plans for equipment at the largest Rogun GES in Central Asia. [By TASS from Kharkov] [Text] [Moscow, IZVESTIYA in Russian 17 Aug 82 p 2] 10272

AZERBAIJAN POWER OUTPUT--The meters of the Azerbaijan GRES today recorded the output of the billionth kilowatt hour of electric power since the plant went into operation. This goal was reached a month ahead of the plan. The early

starting-up of the first 300,000-kilovolt power unit has provided an opportunity, without harming the power system, to shut down obsolete and ineffective equipment at a number of other plants. At present, preparations are being accelerated to complete the second unit at the plant and the construction workers have promised to deliver it ahead of time, in October. [By TASS from Azerbaijan] [Text] [Moscow IZVESTIYA in Russian 20 Aug 82 p 1] 10272

SLOW NUCLEAR CONSTRUCTION--In front of me is a regular summary on the course of construction at the Rostov AES. At first glance, the situation seems normal. The general contractor, the Atomenergostroy [Nuclear Power Construction] Administration with its own forces is steadily using the assigned funds and is increasing the pace. Some 16 basic projects have been set apart where the human and material resources are to be concentrated. The trade union committees from the general contracting and subcontracting organizations have commenced a competition at these projects using the "worker relay" principle. A council of party organization secretaries is at work at the project. Still things are going far from scheduled. At 13 of the major projects, month after month the schedule is not adhered to and the subject quotas are not fulfilled. Thus, in May alone over 1.2 million rubles were not used. A large amount of the blame for not meeting the schedule rests on the leaders of the general contracting and subcontracting organizations who, in signing the contracts, then immediately forget about them. This is formalism in its purest form! Let us look at one of the basic projects which requires special attention. The brigade collective of I. Golubkov from the Gidrospetsstroy [Hydraulic Special Construction] Administration, in relying on the assurances of the leaders of the SMU-6 [Construction-Installation Administration] that the pilings would be sunk on time, promise to complete the piling foundation at the end of June. At this same time, in parallel the grill work was also to be done. Here there was nothing complicated as the brigade was capable of sinking 40 pilings a day. But they could not be delivered in the required number to the sight by the two leaders: the chief of the SMU-6 N. Plygunov referred to the lack of KrAZ [trucks] for transport while the chief of the motor transport administration I. Murugov asserted that there was no order for the special transport. As a result, the building of the grill work fell 24 days behind schedule. The AES construction workers, in order to eliminate the lag on the main building, in May should have completed the underground foundation work for the reactor department. But they did not. A particularly great lag was permitted by the Gidromontazh [Hydraulic Installation] Administration. The Atom mash [Nuclear Machinery] Plant also did not fulfill its contractual obligations as it did not supply the project with metal cell units. The brigade leaders I. Golubkov, V. Mareyev, A. Krasnopol'skiy and V. Lazarev who put their signatures on a contract for a socialist competition within a small "worker relay," were hoping that word would conform with deed. But there was little concern for this by the organizers of the competition, the site committee of the Volgodonsk-energostroy [Volgodonsk Power Construction] Trust (chairman A. Kapendyukhin) and the party committee (secretary V. Sud'in). Here the concluded contracts were filed away and the matter considered finished. The site is frequently visited by leading workers from the USSR Minenergo such as the deputy minister A. Semenov and the chief of the Glavzavodspetsstroy [Main Plant Special Construction] Association Ye. Kuz'michev. But their visits do not leave any noticeable traces. The project needs additional equipment and labor resources. These questions are not new ones and as before are waiting a resolution. [By SOTSIALISTICHESKAYA INDUSTRIYA correspondent V. Aksenov from Volgodonsk] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian, date and page unknown] 10272

GREATER TURBINE EFFICIENCY--Initially it seemed to us that with the early completion of the Nurek GES the "worker relay" would disappear at this project. But it turned out that this was not the case. Here friends in the "worker relay" also had their say and these were the operational workers who took over the plant from the construction workers. In monitoring the operation of the nine units at the plant, they reached the conclusion that due to the excellent quality of equipment manufacture and installation, the "safety factor" for the units was significantly higher than had been envisaged in the plans. Consequently, there was an opportunity to increase the load on each unit and thereby increase its capacity. This idea was passed along the chain to the construction workers and supplier plants. The chain has again gone into full operation. Having checked the observations and calculations we have reached the conclusion that the capacity of each power unit with minimum expenditures could be increased by 10-13 percent. This means 300,000 kilowatt hours of electric power a year and this is the equivalent of starting up another tenth unit at the plant. This symbolic unit is capable of providing a completely real--and sizeable savings of state funds since the additional energy will be generated on virtually the same equipment and with the same plant personnel. At present active work is underway to carry out this idea. On its path stand two main tasks: to strengthen the cooling of the front parts of the generators and eliminate vibration arising in operating the turbines at an increased load. Our friends in the competition, the Sverdlovsk and Kharkov workers, have found a dependable and economic solution to these complex engineering problems. At present, the plants are completing the preparations of the technical documents and testing is underway on models of the power units. The approximate cost of all the work to increase the output at the Nurek GES is 2 million rubles. The economic gain is over 50 million rubles annually. The Nurek power is the cheapest in our nation. With the starting up of the "tenth unit," the plant will operate just as dependably and even more economically. By this speech at a worker meeting I would like to emphasize the importance of a creative attitude toward the development and support of initiatives. [By A. Mel'nikov, chief of the Nurek Hydropower Construction Administration] [Text] [Moscow TRUD in Russian 10 Jun 82 p 1] 10272

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FUELS

SIX-MONTH COAL PRODUCTION REPORT GIVEN

Moscow EKONOMICHESKAYA GAZETA in Russian No 29, Jul 82 p 4

[Article by P. Valentinov: "Six-Month Results: How the Commitments are Being Fulfilled"]

[Text] A total of 420 mining brigades in the first 6 months have extracted a thousand and more tons of coal per day. They have brought to the surface in 6 months a total of 77 million T of fuel. The number of collectives of "thousand-producers" as compared to the same period as year has increased.

In developing the movement "thousand-workers" the associations "Rostovugol'," "Gukovugol'" and "Yuzhkuzbassugol'" have achieved good results. The brigades headed by K. Markelov ("Gukovugol'") and N. Reshetnikov ("Yuzhkuzbassugol'") are confidently fulfilling the commitments adopted in the competition for extracting one billion tons of coal this year.

In the first six months, the brigade of miners V. Ignat'ev from the Donetsk mine "Krasnolimanskaya" yielded 55,000 T of coal in addition to the commitments, the brigade of V. Yelagin from the Kuznetsk mine "Oktyabr'skaya"--130,000 T, and the brigade of N. Gladkiye of "Shakhtinskaya" in Karaganda--103,000 T.

In competition for high-speed making of preparatory shafts, the brigade of drillers headed by V. Rud' (mine "Yubileynaya" in the Kuzbass) and V. Vernigorov (mine "Pavlogradsкая" in the Donbass) achieved excellent results. The first of them passed 621 m of mine shafts in addition to the commitments for 6 months, and the 2nd--276 m.

The six-month results indicate that the coal industry as a whole has improved its work. The sector for main technical-economic indicators has fulfilled the plan. In June, coal extraction rose, as compared to the same month as last year by 3.7 percent, or by 2.1 million T. The assignment for shipping coking and graded coals was realized ahead of schedule.

In the last 6 months, 142 million T of coal have been extracted by the open pit method, 4.6 million T more than the first half of 1981.

The plan has been fulfilled for making preparatory shafts. The situation with preparatory operations in the Kuznetsk basin has improved. There has been an increase in the volume of stripping operations at the coal pits. It rose in the first six months by 7.3 million m³ as compared to the same period of last year.

At the same time, there are serious shortcomings still in the work of many mines. A certain decrease has been permitted on the average load on the stoping base. Consequently, a number of large associations have sent brigades of specialist with the instruction to find out the reasons and to take efficient measures for improving the load on the stoping faces, primarily complex-mechanized.

The task of the miners is to create at the industrial enterprises, power plants, in the cities and settlements the necessary reserves of coal for the coming fall-winter period.

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FUELS

MOSCOW COAL BASIN PROGRESS OUTLINED

Moscow EKONOMICHESKAYA GAZETA in Russian No 29 Jul 82 p 17

[Article by Ya. Chukseyev and M. Morozov, mining engineers: "Podmoskovnyy Coal Basin"]

[Text] Forty years ago, in July 1942, the Ukaz of the Presidium of the USSR Supreme Soviet awarded 343 of the best workers and mining-engineering workers of the "Moscow stokehole" orders and medals for model fulfillment of the assignment of the government to restore coal mines of Podmoskovnyy basin and fulfillment of the coal extraction plan.

After restoration of the mines the miners of Podmoskovye were set the task of reaching the level of the prewar extraction, 35,000 T per day. In September 1942 this level was already reached. The miners of Podmoskovye guaranteed continuous supply of the capital's industry and railroad transportation with fuel. In September 1943, the State Committee of Defense in its decree noted that the Podmoskovnyy basin, which was destroyed during the occupation, increased coal extraction as compared to the prewar level by 18 percent. In 1945, the Moscow basin produced over 20 million T, over 17 percent of all coal extraction in the country.

In the postwar years the Podmoskovnyy basin was converted into a powerful coal base with modern mines and open pits, plants for production and repair of mining equipment, electromechanical workshops, its own scientific research and planning-design institute. Well-built cities and settlements grew up here. The mining Podmoskovye became the motherland for creation and the pioneer of introduction of stoping mechanized complexes "Tula," other machines and mechanisms.

The coal enterprises of the basin are distinguished by a high degree of mechanization and automation of the production processes.

As a result of comprehensive mechanization and automation of the production processes, the technical-economic indicators for mine work were successfully significantly improved. Thus, at the mine "Podmoskovnaya", the largest in the basin, each of its sections brings to the surface over a thousand tons of coal per day. The section headed by A. Titov, starting in 1977, has annually extracted over 600,000 T. Labor productivity in calculation

for one worker here in 1981 was 598 tons per month, and the net cost of a ton of coal was 90 kopecks. In 1982, the collective from the section was obliged to extract 700,000 T and has confidently approaching the outlined goal. The sections of "thousand-producers" in the basin yields 30 percent of the extraction.

Complicated and responsible tasks face the miners of the Moscow basin in the 11th Five-Year Plan, for the entire basin now plays an important role in the fuel and energy complex of the country, especially the central regions of the European sector. It is not easy to fulfill these tasks, since the mines constructed in the 1950's are gradually being worked. Therefore a search is underway for additional, deep reserves for increasing the coal extraction, lengthening the service life of the active enterprises. New mines are being built in the basin.

Thus, at the mine "Brusnyanskaya" a reserve field has been discovered and is already being worked with industrial reserves of almost two million T. High-speed building of galleries of main directions is underway for stripping the reserve section with reserves of 1.5 million T at the mine "Kamenetskaya."

In response to the concern of the CPSU Central Committee and the Soviet government for further development and technical re-equipping of the coal industry, and improvement of the wages of the miners, the workers of the Podmoskovniy basin are further expanding socialist competition for early fulfillment of the 1982 and five-year plan as a whole, improvement in the efficiency of production, conservation and economy. Last year 2.5 million T of coal were produced above the plan. The assignment for the first half of this year has been overfulfilled. A total of 518,300 T of coal versus 400,000 has been extracted above the plan according to the previously adopted commitments.

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CHELYABINSKUGOL' RESPONDS TO CRITICISM WITH IMPROVEMENTS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 16 Jul 82 p 4

[Article: "Miners Take Measures"]

[Text] The leadership of the association "Chelyabinskugol'" and USSR Ministry of the Coal Industry have been criticized for interruptions in the planned assignments, and for lagging in the preparation of the stoping front by SOTSIALISTICHESKAYA INDUSTRIYA.

Information about this was published under the heading "We Name the Laggards" on 15 April of this year.

In response to the editorial staff, Deputy Minister of the Coal Industry of the USSR Ye. Rozhchenko reported that the criticism of the association and the ministry was correct. In order to study the created situation and the adoption of measures at the site in Chelyabinsk, a group of specialist from the USSR Ministry of the Coal Industry headed by the Minister B. Bratchenko visited. Together with the local managers they outlined paths for overcoming the lagging in the mines. A set of measures was developed which stipulated primarily guarantee of additional stoping fronts for the mine "Tsentral'naya," "Komsomol'skaya" and "Baturinskaya." On the whole for the association, the number of comprehensively-mechanized faces will be brought to 27, with a rise in the average daily load on the complex of up to 700 T.

In order to solve the set tasks, in the first six months of this year with advance of the schedule the association has already received 11 tunneling combines, 2 complexes "KM-87DN" and one "20 KP", 65 conveyers, drilling machines, railroad cars and other equipment. "Chelyabinskugol'" has been allocated additional funds for cement, rolled materials of ferrous metals, pipes, truck transport, bulldozers, excavators and lifting cranes.

The ministry has entrusted the institutes Scientific Research Institute for Stripping Mine Operations and "Uralgiproshakht" to help the association in questions of preparing extraction fields for the future. The USSR Ministry of the Coal Industry has obliged the association to increase the volume of construction of housing through the forces of the trust "Chelyabinskuglestroy" and economically.

The editorial staff was also answered by the general director of the association "Chelyabinskugol'," A. Druzhinin. He wrote about what is being done to eliminate the causes negatively influencing the work of the mine. Thus, in the mine "Tsentral'naya," new stoping faces have been prepared and opened. This made it possible for the enterprise to increase the daily average extraction of coal in June versus May by 1,360 T. The planned number of stoping faces has been guaranteed for the mine "Baturinskaya."

A lot is being done to reinforce the working cadres. In August a dormitory will be opened for students of the technical school in the city of Kopeysk. Measures have been taken to improve organization of competition at enterprises of the Chelyabinsk coal basin.

The secretary of the Chelyabinsk CPSU obkom, L. Il'ichev reported about measures to overcome the lagging. Joint meetings were held of the active members of the workers in coal extraction enterprises, meetings of the secretaries of the party organizations of the mines and open pits, and councils of the directors. The implementation of the outlined measures will make it possible to improve the work of the association in the second 6 months.

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FUELS

IMPROVEMENTS OUTLINED FOR KATEK

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Aug 82 p 2

[Article: "Increase the Open Pits of KATEK"]

[Text] The Kansk-Achinsk complex where enormous coal reserves are concentrated has been called upon to play an important role in supplying fuel and energy resources to the regions of East Siberia and the Far East. Urgent problems of establishing it and developing it were raised in the article by the secretary of the Krasnoyarsk party kraykom, L. Sizov "Increase the Open Pits of KATEK," which was published in our newspaper on 2 April of this year. The discussion in particular was concerned with the discrepancy in the actions in the ministries and departments participating in the construction, the lagging in housing construction, the need for use of modern equipment to accelerate the stripping operations at the thick coal pits.

Deputy chairman of the USSR Gosplan A. Lalayants in an official response to the editorial staff reported measures which have recently been taken to improve planning of major construction at the complex territory. Capital investments for construction of enterprises and facilities included in KATEK are stipulated in the annual plans for the individual construction site. The funds for equipment, fittings, control-measurements, equipment for automation and other items to complete these construction sites have been allocated so that their shipment is guaranteed in the first 6 months in a sum of 65 percent of the annual need.

The interested ministries and departments have been set specific primary assignments to guarantee in 1982-1985 the start-up facilities at objects of KATEK, as well as for construction of houses, facilities of social-general and communal purpose. The personal responsibility for fulfillment of these assignments has been laid upon the first leaders of the USSR Ministry of the Coal Industry, USSR Ministry of Power and Electrification, USSR Ministry of Heavy and Transport Machine Building, Ministry of Transportation Construction and other ministries.

The USSR Gosplan has additionally examined the question of supplying the open pits of KATEK with powerful excavators. This was also discussed in the article. A decision has been adopted to allocate in 1982 to the USSR Ministry of the Coal Industry two excavators "EKG-12.5" produced by the Krasnoyarsk plant of heavy machine building.

Questions of further improvement in planning, control of construction and operation of the enterprises of KATEK in order to prevent interdepartmental separateness will be especially examined in the USSR Gosplan in the future.

The measures taken to improve construction of housing, objects of cultural-general purpose, trade and public nutrition in the KATEK zone were reported by the Deputy Minister of Power and Electrification of the USSR V. Kozhevnikov. In the cities of Sharypovo and Nazarovo, construction has been started of house-building combines. It is planned to open the first of them this year, which will make it possible to limit, and in 1984 completely eliminate the importing of house building structures from other regions of the country. The houses will be produced with improved planning. The collective "Pratskgesstroy" has been brought for construction of housing and social-cultural-general facilities.

It is planned in 1982 to produce housing in Sharypovo with total area of 90,000 m² instead of 40,000 m² stipulated by the plan. Efficient monitoring of the course of construction of KATEK facilities has been set up.

After examining the article "Increase the Open Pits of KATEK" writes the Deputy Minister of USSR Coal Industry A. Pshenichnyy, the ministry admitted that it was correct and timely. The USSR Ministry of the Coal Industry is taking measures to increase the number of subdivisions in the trust "KATEKuglestroy" involved in constructing the open pit "Berezovskiy-1." Construction has begun of a well-built pioneer settlement of builders at the Dubinino station. As of 1 July 1982, housing here had been constructed with total area of 54,500 m², a kindergarten, three cafeterias, two stores and other facilities. In the third quarter of this year, a club will be opened for 300 places, a school and bath.

Facilities have been erected at the pioneer base for output of commercial-grade concrete, mortar and asphalt-concrete. This year construction will be completed of an automobile base, base of mechanization, workshops and warehouses. Work is being developed to create a support base for the combine. In the first 6 months, the number of workers of the combine "KATEKuglestrov" involved in building facilities for the fuel section of the complex increased by 450 people. At the same time, the plan for construction-installation operations at the open pit "Berezovskiy-1" continues to be unfulfilled mainly because of the lack of completing of the construction organizations. A shortage of worker cadres is explained by the fact that the USSR Ministry of Power and Electrification which is the developer of the city Sharypovo is not fulfilling the instruction of the directive agencies to transfer part of the built housing fund to the coal workers.

The publication also was examined in the RSFSR Ministry of Automobile Roads. The minister A. Nikolayev reported that fulfillment of work to build automobile roads in the region of KATEK has been given to the newly organized Sharypovo Road Construction Administration No 8 and Nazarovo Road Construction Administration No 3. In order to strengthen their production potentialities, six excavators, fourteen bulldozers, six truck scrapers, eighteen truck graders and other necessary special equipment has been allocated.

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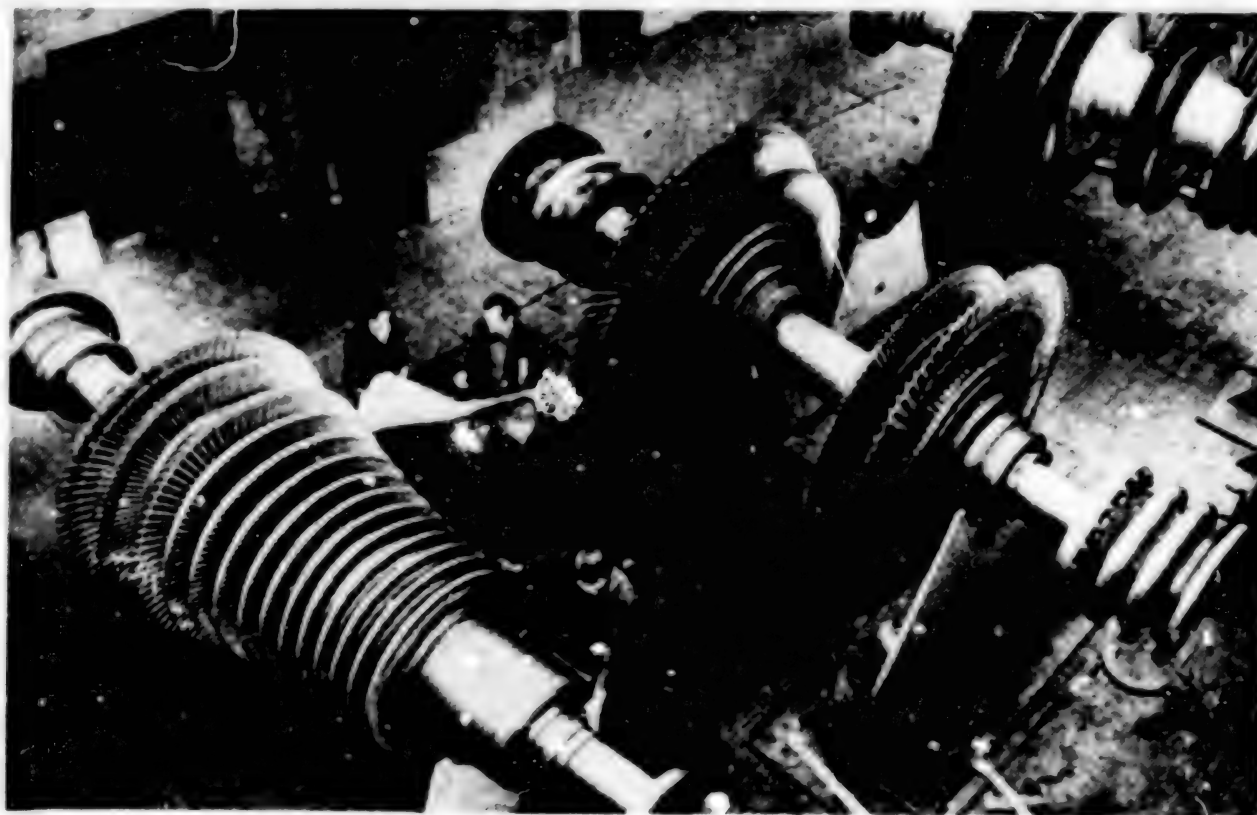
PIPELINES

NEW GAS TURBINES FOR URENGOY-POMARY-UZHGOROD TRUNKLINE

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Oct 82 p 1

[Picture caption]

[Text] An area of the mechanical assembly shop.
The collective of the production association "Turbomotor Factory imeni Voroshilov" in Sverdlovsk has begun producing 16,000 kW gas turbines for the export trunkline Urengoy-Pomary-Uzhgorod. In honor of the 60th anniversary of the formation of the USSR, the workers of the enterprise have promised to complete the plan ahead of schedule.



CSO: 1822/23-P

PIPELINES

DISPATCHER DISCUSSES UNIFIED SYSTEM OF GAS SUPPLY

Frunze SOVETSKAYA KIRGIZIYA in Russian 19 Aug 82 p 2

[Interview with chief engineer A. Vorotyntsev by correspondent of the Novosti press agency B. Busygin: date and place not specified: "Precise Rhythm of the Gas Pipeline 'Soyuz'"]

[Text] The gas-transport complex "Soyuz" built by the Soviet Union in cooperation with the European countries of CEMA has been continually operating for 4 years. Information of the dispatcher services regarding the passage of the gas stream on the territory of the USSR comes to the Central Dispatcher Administration of the Unified System of Gas Supply of the country which is located in Moscow.

The correspondent of Novosti Press Agency B. Busygin met with the chief engineer of this administration A. Vorotyntsev and asked him to answer a number of questions.

[Question] What is the USSR Unified System of Gas Supply?

[Answer] "If you look here at this plan," the chief engineer points to the wall, "then you see that it is covered with a dense network of twisting lines which stretch into different regions of our country. They designate the main gas pipelines whose extent exceeds 130,000 km. Unification of all of them into a single system makes it possible to rapidly control numerous gas streams and to provide gas to different facilities both within the country and beyond its limits.

The rates of construction operations and length of the routes increase with each year. Their network is shifting more to the north and east of the USSR, where new large fields of 'blue fuel' have been found. The word 'Urengoy' is now identified with six new gas trunklines which will open access to the richest storehouses of West Siberia. The length of each of them exceeds 3,000 km, and the export gas pipeline Urengoy-Uzhgorod extends 4,650 km. All of them will have high throughput, pipes of diameter 1420 mm are being laid in the trenches.

[Question] Probably one of the first "test sites" where these pipes were tested in operation was the gas pipeline "Soyuz"?

[Answer] Yes. Generally the "route of friendship," as it is called in the socialist countries, in its technical parameters occupies a special place in pipeline transport of the USSR. The route of 2750 km intersects three union republics, RSFSR, Kazakhstan and the Ukraine, and carries that quantity of "blue fuel" which contains energy equivalent to the potentialities of five GES's as the Bratskaya on the Angara.

The branch network of dispatcher stations which encompasses all the sections of the gas pipeline helps to control such a powerful stream. Each compressor station is under strict monitoring. Using a computer and television devices, the dispatchers follow the regime in which the complicated electronic equipment is operating, and guarantee observation of the assigned parameters. The dispatcher points at the compressor stations maintain constant communication with their central dispatcher services in Orenburg, Saratov, Volgograd, Cherkassy, Ivanovo-Frankovsk which rapidly send information about "Soyuz" on an automatic system of data transmission to the central dispatcher administration in Moscow.

The precision activity of the dispatchers, the excellent technical equipment serves as a guarantee of reliable operation of "Soyuz." During its operation there were no stops in the supply of gas or any technical malfunctions. Say that at some station preventive maintenance is done, then the lacking facilities because of the disconnected gas pumping unit are compensated for by additional loading of another station. Thus, the quantity of pumped raw material at one level is successfully preserved.

Over one hundred billion m³ of gas have been shipped on the gas transport system "Soyuz" during the years of its operation. About half of this volume came to the countries participating in the construction, People's Republic of Bulgaria, Hungarian People's Republic, GDR, Polish People's Republic, Socialist Republic of Romania, and CSSR. The remaining "blue fuel" went for the needs within the country and for export to the capitalist countries. The general agreement on shipment of gas to the CEMA states was not interrupted at all, and at the request of the GDR and Poland shipments to these countries were even increased in 1982.

[Question] One facility, a plant whose construction is being completed by the Czechoslovakian builders in the Volga city of Kamyshin is closely associated with the "Soyuz" gas pipeline. What is its purpose?

[Answer] This plant is for repair of production equipment. The method of plant repair at gas pipelines has recently been used in the USSR. Now it is becoming more widespread. Large assemblies of units from compressor stations will be repaired at the plant areas. This will significantly improve the quality of repair. It is complicated to perform this work at the station itself. The Kamyshin plant will service not only "Soyuz," but also other close gas pipelines. Its start-up will increase even more the reliability of the "route of friendship."

PIPELINES

VOLGA-VYATKA PIPELINE EXTENDS FURTHER

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 3 Aug 82 p 1

[Article by U. Bogdalov, our in-house correspondent: "The Route Goes Over the Horizon"]

[Text] The 30-meter band split the green vastness to the horizon, just like the landing strip of a giant airport. The impressive sight depressed only the chairman of the kolkhoz here who came to call on the route workers. He spoke bitterly of the hectares which were lost from farming.

"Don't worry, we will preserve the ground as in a savings bank," the head of the excavators of the fourth construction section V. Ivanov calmed the chairman. "We will cover the pipe, and we will return the fertile layer to its place. It will do double duty, it will grow grain and the gas will pass through it."

The route moves ahead boldly. A week ago at the band prepared for recultivation, the excavators penetrated the ground for the first time. Today the clay shaft smoothed by recent rains, extends five kilometers. The black length of pipe goes twice as far beyond the horizon. It seems as if the trench is attached to the very edge of the blue sky. You can see the entire construction site of the gas pipeline, perhaps only from the orbit of "Salyut," and then not immediately.

"Our section of the gas pipeline Urengoy-Uzhgorod," says the head of the production section of the trust "Tatnefteprovodstroy" I. Lukovskiy, "extended from the Volga to Vyatka 230 kilometers. We are faced with passing 15 large and small rivers, crossing railroads and highways many times. And we have to do this without interrupting the transport traffic."

We see how this is done on the road Kazan-Dubyazy in the morning. The base of the road bed is extended minutely by the route workers. The cars travel without delay above the drilling unit rumbling in the earth. There is a special approach to ravines at this construction site. The pipes never cross them in air or on bridge structures, only underground. Therefore the ravines are filled, and water-passage structures are installed.

The gas pipeline is not only a pipe laid at a depth of 2.5 meters. It is also well-built cities for the builders, powerful compressor stations, high voltage transmission lines and communications. In Pomary and Shemordan, the trust has been building base housing cities since early spring. Two-apartment arbolite houses installed here are equipped with all the conveniences. Next to each there is a garden. Field athletic complexes are being built for the route workers with swimming pools, and saunas. The route is no longer a synonym for harsh life. This foresight is understandable. In the near future another four lines of powerful gas pipelines separated from each other by several tens of meters will be laid through one "corridor."

"Tatnefteprovodstroy" plans to finish all the work on the Urengoy-Novopskov route by the end of the year. But the situation has required compression of time, and the trust, having mobilized all reserves, will complete the assignment already in August.

The production line headed by Hero of Socialist Labor I. Shaykhutdinov has been sent to the route of the export gas pipeline. A total of 34 kilometers of long lengths have been welded at the pipe-welding bases. Fourteen kilometers of them have been brought to the route and ten have been connected into one line.

Becoming familiar with the work of the "Tatnefteprovodstroy" laborers, you see that they all have one task: do as much as possible to the approach of the main forces. Advance further the band for subsequent recultivation, weld more lengths and cut clearings in the forest. The maximum output is required from people, machines and mechanisms. But not everything here depends on the builders of the trunkline.

For the first time the trust has started to use the powerful welding complex "Styk" that was developed by the Kiev Institute of Electric Arc Welding imeni Ye. O. Paton. It should guarantee highly productive high-quality welding. Now, however, this is not being done, no matter how they struggle at the route. Criticism here should be aimed at the specialist of the institute who are giving different excuses for refusing to help the welders.

This situation is inexcusable the more so since accelerated laying of the gas pipeline after the known sanctions of the Reagan administration has become an important and primary matter not only of the direct builders of the route. Glavtatsstroy has started to cut kilometers of forest "corridors" near the Volga. This is not only help, but also prudent use of land. The organizations of the local Soviets of People's Deputies are being actively included in the work. It was said very accurately at meetings which took place in many collectives: no bans will stop the great construction site.

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PIPELINES

DESPITE DIFFICULTIES, VYKSA PLANT PRODUCES MULTILAYER PIPES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 21 Aug 82 p 1

Article by V. Noskov, in-house correspondent: "There are Multiple-Layer Pipes!"

[Text] The first several thousand tons of multiple-layer pipes for laying the superpowerful gas pipelines from West Siberia and construction of water pipelines for irrigation systems in Central Asia have been sent by the collective of the Vyksa metallurgical plant.

In Vyksa for the first time industrial technology has been mastered for production of a unique product which has been called upon to complete the current technical revolution in pipeline construction. It has been introduced and has been operating not at an experimental section, but in a modern shop equal in scales to an entire plant. The shop with its auxiliary rooms and services is located on a territory of several dozens of hectares. The main equipment occupies a bay almost a kilometer long. Only the first phase has been started up.

"We can produce multiple-layer pipes at the same time of several diameters and with different thickness of the walls, depending on the purpose," relates the head of the shop B. Yefremov. "They are designed for working pressure of 100-120 atmospheres, which is roughly double the pressure in the currently operating gas trunklines."

The new pipes will permit a much greater improvement in the throughput of the underground steel arteries and conservation of a lot of metal. Where previously two lines of gas pipeline had to be laid, one can now get by completely with one.

We are going along the roller conveyers which are operating in an automatic regime. Metal bands are cut without the interference of man. In front of our eyes, bands of metal are converted into round shells 1.5 meters long. The machines rapidly lay even seams on the circumference. Special units using ultrasound check the quality of the welding.

The complicated equipment requires high skill of the service personnel. It is no accident that the majority of workers here have secondary special education. The class of skill is indicated by the electric welders A. Ryabov, S. Luk'yanchikov, L. Borišov, defectoscope operator G. Glebova and many others. Communists are working at the most important production operations.

But not everything in the new shop is going smoothly. In August for reasons not depending on the collective, the unique equipment was standing for more than 10 days. The Zaporozh hardware plant had not shipped the welding wire in time. Interference of the first deputy minister of ferrous metallurgy of the USSR S. Kolpakov was required in order to bring the subcontracters into order.

"We do not have any guarantee that the shop again will not be in a difficult position," notes the brigade foreman V. Yeremin. "We have just returned to the Cherepovets plant about a thousand tons of defective metal. We are again preparing to return another eight rolls."

It is impossible not to discuss another problem. At the request of the gas workers in Vyksa, manufacture of multiple-layer pipe with plant insulation was started so that they could be immediately welded into a line at the site. This requires equipping of a special section. This question was solved at a joint meeting of the representatives of the union Ministry of Ferrous Metallurgy and Ministry of Construction. In the protocol signed by the ministers I. Kazanets and G. Karavayev, it is written: "Guarantee start-up of the experimental-industrial section for covering pipes with polymer bands in July 1982." But we are already approaching the end of August and this decision has not yet been fulfilled: the builders of trust No 10 "Metallurgstroy" let us down.

Before the end of the year the collective of the shop has been obliged to manufacture 80,000 T multiple-layer pipes. There are potentialities for this. Everything should be done in order that they can successfully fulfill the plan and more rapidly produce the first phase of the new industry at full power.

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RIVER CROSSINGS OF MOZDOK-KAZI-MAGOMED PIPELINE DESCRIBED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 Aug 82 p 1

[Article by L. Aleynik: "Through Mountain Rivers"]

[Text] Builders and installers from USSR Ministry of Installation and Special Construction Work and the Ministry of Construction of Oil and Gas Industry Enterprises are working on laying the main gas pipeline Mozdok-Kazi-Magomed at an intensive rate. Here, on the route, the start-to-finish "worker's relay race" is in operation. It is impossible to work any other way for the gas pipeline is the start-up object of this year.

"The most complicated sections are the junctions through the mountain rivers of the North Caucasus, where there are floods after downpours and large discharges of water, and there is a complicated hydrogeological situation on the entire route," relates the manager of the trust "Gidrospetsfundamantstroy" Artem'yev. "Now we have to drain off the river bed and erect dams. In a word, there are enough difficulties but a lot has already been done. The piling junctions are ready for the Terek and Sulak. In the complicated rock waste deposits at the Sulak, our experienced foundation builder-drillers have successfully rapidly drilled wells and prepared 44 drilling-rammed pilings. Everything has been completed on time here.

Only 2 months were required for the collectives of the trusts "Gidrospetsfundamantstroy" and "Promburvod" to drill under these complicated conditions. Now they have moved their drilling machines and other equipment to the Samur River.

The specialist of the trust "Gidrospetsfundamantstroy" in cooperation with the scientist from the institute "Fundamentproyekt" have successfully significantly helped to accelerate work on the route. They have suggested changing the project and reducing the diameter of the piling by 28 centimeters. This yielded great conservation of labor outlays and decreased the consumption of concrete.

Now the subdivisions of builders and installers are making a forced crossing of the Gyul'gerychay River. Here the leading drilling foremen A. Romanenko, A. Kostin, machine operator of the crane, machine operator of broad profile R. Rezayev, the drillers from the "Promburvoda" N. Vasil'yev, Ya Shpilevoy and other cadre workers are performing excellent labor here. On the entire route of the construction site, competition is expanding of the collectives in honor of the approaching anniversary of our country, the 60th anniversary of the USSR. The efforts of the subdivisions and brigades are aimed at the most rapid completion of the special construction work already in September so that the collectives of the Ministry of Construction of Oil and Gas Industry Enterprises will be ahead.

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URAL TURBOMOTOR PLANT SHIPS PIPELINE EQUIPMENT

Moscow IZVESTIYA in Russian 25 Aug 82 p 1

[Article: "Urals-Gas Trunkline"]

[Text] One of the major suppliers of modern equipment for gas pipelines in our country is the production association Ural Turbomotor Plant imeni K. Ye. Voroshilov. The collective of the enterprise has decided to fulfill the order for shipping equipment for gas pipelines ahead of schedule and in complete volume. These trunklines connect Urengoy with the center of the country and the European countries. In response to the discriminatory measures of the U.S. administration, the Sverdlovsk turbo motor builders in cooperation with the Leningrad and Sverdlovsk collectives of the plants are planning not only to realize the planned assignment, but also to exceed it a great deal. The fulfillment of the important order is discussed by the general director of the association O. Podberezin with the correspondent of IZVESTIYA.

The collective of our association decided to multiply its efforts for early construction of the Urengoy-Pomary-Uzhgorod gas pipeline. We the people of the Urals have the forces, common knowledge and experience, and the technical potentialities to guarantee early shipments of equipment for the trunkline under construction. The Ural turbo motor builders have adopted the commitment with great upsurge, this year already to prepare above the plan 1 gas pumping unit, and in 1983, 14 powerful units instead of the 10 previously planned.

Of course, not very much time has passed, but the results are already visible. The engineering-technical thinking, and working initiative did not stand still even earlier. They were actively working. In recent years the Ural turbo motor builders have designed and implemented into metal industrial samples of a new and more powerful gas pumping unit for pipes of diameter 1420 mm. Its daily productivity is 2.5-fold greater than the previously manufactured series units. This machine surpasses similar American units in a number of technical designs and economic indicators.

In parallel to this technical innovation, the collective of the plant has been intensively working on implementing the technical and organizational measures outlined in the commitments which guarantee accelerated increment in the production facilities. Reconstruction of the second mechanical-assembly shop is going at full speed. Its areas where assembly, breaking-in and testing of new equipment are done are being doubled in size. We are installing on them the most modern machines and are equipping yet another test stand. The blade shop is experiencing its second birth.

Of course, as always, the main driving force is socialist competition, in particular "worker's relay race," the brigade system of organizing labor with the use of the collective contract, calculation of conservation of materials, electricity, labor resources and much more.

The best people in the plant have become the leaders of the innovator movement, turner of the first mechanical assembly shop V. Zykov, brigade foreman of the second assembly shop A. Mishakov, and milling machine operator of the shop of turbine assemblies S. Mikheyev. Their commitments include: fulfillment of increased assignments ahead of schedule without increase in the number of brigades. The question is very important, since the volumes of work are rising, and naturally, the demand for skilled personnel is also rising.

We naturally in the fulfillment of such important assignments are connected to many enterprises of the country. Cooperated shipments cover a broad circle of plant collectives, primarily in the Urals and Leningrad. Our association traditionally and in a business-like manner cooperates with "Uralmash." Creative contracts have been formed with the Neva machine builders, with the workers of the metallurgical plant and the Leningrad plant of turbine blades, with many construction organizations. Of course, the timely fulfillment of the state assignment depends a lot on our subcontracters.

Here one should stress that all of us have been united by the "worker's relay race." We have appealed to our subcontracters to search for reserves and to provide cooperated shipments ahead of schedule. All of them responded in a business like way to our request. This year the collective of "Uralmash" will additionally supply to the turbomotor plant 210 T of forged pieces, discs and rotors. This is an above-plan load for the Ural machine builders. But this is the basis for the worker's mutual assistance: in the work time they support their comrade, and extend to him the hand of mutual assistance. Our order was understood by the production workers of the sector flagship. On the initiative of the committees of the Komsomol of the subcontracting plants, start-to-finish posts developed in the shop. They strictly follow the fulfillment of the shipment schedules and the quality of the metal.

The collectives from the trust "Sverdlovskpromstrov" are taking the most active participation in the "worker's relay race." On short schedules they must erect a solid base for the new industry, in particular, make a foundation for the machine fleet, prepare for start-up yet another stand for testing the more powerful gas pumping units.

We are placing high hopes on the Leningrad suppliers. The timely start-up of four objects depends a lot on them. This year they should already equip the Ural pipe builders with modern equipment. Three large enterprises of the city on the Neva, the plant of turbine blades, the associations "Nevskiy mashinostroytel'nyy zavod" imeni V. I. Lenin, and Leningradskiy Metallicheskiy zavod" according to the active cooperation must supply us with intermediate parts, and also partially work the blades and polished disks. The people of the Urals are confident that the Leningrad collectives will cope on time with the fulfillment of this important order.

Of course, many problems are developing which need to be solved urgently. Increase in the volumes of the order and shortening of the periods of its fulfillment required not only readjustment of production, but also exacerbated the problem of personnel. Now we do not have enough professions of machine operators, including gas cutters and electric welders. Taking into consideration this situation, the board of the association, party and trade union committees have developed a program for accelerated training of skilled specialists of these professions. We hope that the local soviets involved in the organizational selection of the work force will make their contribution to such an important matter.

Even more perceptible help is required in fulfilling the adopted commitments on the part of the planning-technological and other scientific institutions. With a basic technical renewal of production, we need the development of scientifically substantiated programs to switch the machine fleet to more intensive, accelerated regime. Here the advice and consultation of the scientists and metal experts are very important.

The Ural turbomotor builders are doing everything so that the order which was given by the motherland will be fulfilled on time and completely, namely to have a worthy meeting of the 60th anniversary of the formation of the USSR.

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AUCCTU COORDINATION COUNCIL EXAMINES RESULTS OF WORKER'S RELAY RACE

Moscow TRUD in Russian 20 Jul 82 p 2

[Article by V. Kapel'kin, special correspondent of TRUD: "Broad Step of 'Worker's Relay Race'"]

[Text] The rate of socialist competition of the collectives participating in construction of the main gas pipelines of West Siberia-European sector of the USSR and the export line Urengoy-Uzhgorod is picking up speed. Last year the AUCCTU created a coordination council for the development among the labor collectives participating in construction of the main gas pipelines of socialist competition on the principle "worker's relay race," which united the efforts of organizations and enterprises in dozens of sectors, local trade union headquarters of the competition. Our story today is about the out-of-town expanded meeting of the coordination council in Kuybyshev, which was held by the secretary of AUCCTU I. I. Gladkiy. It began with a trip to the route.

Passed the green Zhiguley-gor, in the bright "Zhiguley" cars we are traveling towards the Tolyatti compressor station of the Urengoy-Petrovesk gas pipeline. Here is an interweaving of enormous pipes, airplane hum of two active structures and lively construction site of the new station. A. A. Volkov, deputy manager of the trust "Kuybyshevtruboprovodstroy" is guiding the guest around the facilities.

It also seems to the uninitiated that the gas pipeline is simply a long super long pipe. But the blue fuel does not travel by gravity thousands of versts. It is pushed ahead by the powerful pressure of compressor stations. There are dozens of them. The Tolyatti, for example, is the 21st, if you count from Urengoy.

Anatoliy Andreyevich reported: here the pins were driven in in December of last year. Now, in March, the last foundation has been completed. Now the equipment installers are already working in the building.

About 800 enterprises, planning, contracting, transport organizations included in 40 ministries and departments have been involved in construction of the main gas pipeline. The outlays for laying six gas mains in this five-year plan will exceed the cost of building KamAZ [Kamchatka Automobile Plant], BAM [Baykal-Amur Trunkline], VAZ [Volga Automobile Plant], "Atommash."

The head of the coordination council, chairman of the trade union central committee for the workers of the oil and gas industry, V. T. Sedenko dedicated his speech to the task of the committees of trade unions, economic leaders for mobilization of the efforts of the labor collectives in the Tyumen Oblast, subcontracting organizations for successful fulfillment for the plans and commitments for 1982.

The "worker's relay race," which is directed by the coordination council makes it possible to dispose of the available resources better. It happens that the long-awaited equipment gets stuck somewhere on the way to the construction site. The "worker's relay race" should help this.

The question of changing the periods of shipments planned by quarters is being solved favorably for the situation. That is, the enterprises can immediately ship products at the end of three months, and no one has a right to formally criticize them. However the builders of the gas trunklines are often interested in receiving equipment in the beginning of the quarter. The "worker's relay race" helps to implement this. Say that the Moscow production association "Borets" of the Ministry of Chemical Machine Construction is preparing a shipment of the compressor "U.P.-80" to Urengoy in July, although initially it was planned for August-September.

These measures help to coordinate the efforts of the labor collectives and to set up a precise rhythm.

This is the so called outer ring of the subcontracters. Now let us talk about the small loop of the "worker's relay race" which encompasses the brigades of route workers. In the trust "Severtruboprovodstroy" the welding-installation brigade of USSR State Prize laureate B. P. Diduk, brigade of installation workers V. D. Madenov have become the initiators of this comprehensive competition. United by contracts of cooperation with the extracting complexes of machine operators, transportation links and other collectives, they are leaving behind them 1.5-2 kilometers of finished route per day.

"The worker's relay race" helps to introduce line methods of construction in other sections of the trunkline. Recently the Ministry of Construction of Oil and Gas Industry Enterprises issued an order for organization of work of comprehensive cost-accounting production lines whose teams should move one after another in strict synchronism.

If one team of the production line, say the machine operators-excavators, goes way ahead, then there will be no benefit: the trenches will fill up, and they will have to be redone. On the other hand, the same machine operators do not have the right to reduce the rates if the subcontractors are

pushing. The lagging brigade holds up the entire line. The contract of the brigade "worker's relay race" is the regulator which measures out a common beat of movement.

Together with the deputy head of the administration for organization of labor and wages of the USSR Ministry of Construction of Oil and Gas Industry Enterprises, T. N. Cheschko, we leafed through the standard contract of worker cooperation concluded by the collectives of 13 brigades of the comprehensive production line V. A. Nazarov from the trust "Mosgazprovodstroy." The interval between the brigades of subcontractors was defined here as hundreds of meters so that there would be no surplus reserve, and no "tails" would be left. Initially the daily assignment was a kilometer of finished route. But all the teams of the line, united by the "worker's relay race", we stress all the teams, rhythmically and smoothly quickened the speed and produced their section of the Urengoy-Novoposkov route not by the Day of Victory, 9 May, but by 22 April, the 112th anniversary of the birthday of V. I. Lenin.

The tool with which the coordination council of the AUCCTU controls the competition, and maintains its heat, is rapid summary of its results. Many are probably familiar with the pattern where the results for the sectors are summarized once a quarter, and the banners are presented to the leading workers sometime in the middle or even the end of the next period. The Ministry of Construction of Oil and Gas Industry Enterprises on a national scale summarizes the results of competition for laying the line section of the pipelines weekly, for the construction of compressor stations, every two weeks. Data are published on the route for the day. And encouragement of the best workers is not held up.

Recently the builders and gas workers started a new initiative to produce the main routes two-three months ahead of schedule and to bring them to the rated output in the year of start-up. There are no equal rates in the world. Say, the Americans in laying their famous oil pipeline "Great Inch" from Alaska to the central states did not surpass our rates achieved at construction of the gas pipeline Bukhara-Urals, not to mention the modern results.

But naturally there are problems, and not all of them are solved on the spot. The secretary of the Kaybyshev oblast trade union N. D. Korol' and other speakers asserted: the time has come to regulate payment for work of the line engineers, foremen and men in charge, whose level today is two-three-fold lower than the average wages of the workers. Now in laying the export line Urengoy-Uzhgorod the Ministry of Construction of Oil and Gas Industry Enterprises is making an experiment: four enlarged lines which include even service personnel of the field cities, count on finished product, kilometers of pipeline laid and filled and ready for testing. These lines have contracts to lay before the 15th of December a total of 460 km of route, that is, each collective had taken upon itself a volume of work which recently only a medium sized trust was capable of. It is remarkable that the wages of the line engineers here have been included in a single order with the workers and will depend on the total result. Of course, its basis is the official salary of the foremen and men in charge. Part of the resources conserved with reduction in the managerial apparatus is also added, but there is also a

percentage of the piecework extra earning of the brigade and all types of bonuses for the collective. Study of this experience and improvement in the system of stimuli is within the competence of the State Committee on Labor, Ministry of Finance, and of course, the Ministry of Construction of Oil and Gas Industry Enterprises itself.

Behind the routes which are striding in seven-league boots, behind the structures of the pumping stations and wells of gas extraction which are growing up like mushrooms, we also see the problems of the people who must live and work, servicing these structures at times in the wildest places. It is planned to settle everyone in well-built settlements with a complete set of social-cultural-general facilities. But unfortunately, the advances on this front are considerably more modest. The secretary of the AUCCTU I. I. Gladkiy focused attention of the coordination council on the fact that it is impossible to permit an interruption between production and housing-civil construction. "In order not to overlook the periods for erection of houses, schools, kindergartens, and stores it necessary to use all the strength of the trade union influence, all the rights and authorities," he stressed in his report.

The debt for start-up of the route settlements, facilities even in the cities of West Siberia is accumulating for the subcontractors Ministry of Construction of Oil and Gas Industry Enterprises, USSR Ministry of Construction, and USSR Ministry of Heavy Machine Construction. The leaders of the ministries have often promised to correct the situation, they have developed measures, and sent their representatives to the site. But the warning signals are again sounding. Say, of the 11 kindergartens and 7 schools which currently should be provided for the workers of the all-union production association "Tyumengazprom," in the first 6 months not even 4 facilities had been started. The subcontracting headquarters of the Ministry of Construction of Oil and Gas Industry Enterprises which are operating in the Tyumen Oblast are responsible for this. They have adopted the following practice: instead of several facilities in the route settlements, they construct one large one in an inhabited city, and in the reports on the number of places for students or preschoolers figure, and not the number of facilities.

Of course there are changes for the better. Last year 78 percent more apartments were built for the workers of the all-union production association "Tyumengazprom" than in 1980. Take the capital of the gas workers, Novyy Beregoy. Four years ago this was a small settlement consisting of trailers, gullies and panel houses. Today this is a city with a population of many thousand. But the demand for housing and social-cultural-general facilities is persistently rising and is still far from complete satisfaction.

Representatives of 17 sector trade units, and 29 ministries in the hall of the Kuybyshev Oblast trade union reinforced with their signatures the contract "worker's relay race," a large-scale and all-encompassing document. The headquarters, associations, enterprises, trust, institutes and organizations adopted commitments in which their contribution to the construction of the gas pipelines is precisely measured in tons, kilometers, rubles etc., and is limited

by intensive schedules. The motto of cooperation, from mutual claims to mutual help and support, reigns in each of the dozen signatures of the contract on creative cooperation.

Sharing thoughts about the ways to develop comprehensive competition, the secretary of the AUCCTU I. I. Gladkiy noted that the "workers relay race" may also be just as useful in other spheres of the national economy, say associated with the implementation of the food program. It will help to reduce the interruptions in the food conveyer, and losses of products. Now, with the creation of agricultural-industrial associations, the actual structure of the agricultural industry call for a worker's, and more precisely, a worker's-peasant relay race.

In cooperating with progress of economics, comprehensive competition strengthens the consciousness of the common nature of goals, converges the collectives that primarily did not "see" each other behind the departmental fences. The "worker's relay race" educates business-like large-scale thinking people who are necessary for each sector.

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PIPELINE CONSTRUCTION PROGRESS REPORTED FROM KURSK OBLAST

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 15 Aug 82 p 1

[Article by N. Savchenko, editor of the newspaper MOLODAYA GVARDIYA, and V. Pisarchik, our correspondent: "Camomiles Along the Route"]

[Text] The builders of the Kursk arm of the Urengoy-Uzhgorod gas pipeline are extending the trunkline ahead of schedule

Back in spring one could define the site of the future route only by pegs. Now the landscape has been cut by trenches with ravines made of rich chernozem. Around there is a sea field camomiles. The camomiles are even on the table of the head of the construction-installation section No 4 of the trust "Krasnodartruboprovodstroy" V. A. Azanov and they are probably from this field.

During the entire trip to the gas route, we were presistently accompanied by rain. We saw the idle combines and imagined how the machine operators were cursing the weather. Azanov was also disturbed: he also had to stop work.

Of the almost 5,000 km of Urengoy-Uzhgorod gas pipeline, the section of Azanov is responsible for 104. The comprehensive production line as the powerful subdivisions are now called, similar to a fourth section, is noticeably ahead of the schedule for gas pipeline construction. Azanov sites the figures: 51 km of pipes have been welded into lengths, 36 are ready.

"There are all the prerequisites," says Azanov, "for us to complete the work ahead of schedule. The most important is that we have a full set of pipes. We are now working while there is daylight, and there are no interruptions if the weather is not an obstacle. Here, on the line, we have a special feeling for how insignificant are the efforts of the American administration. We are installing pipes of the firm 'Mannesman,' and Italian, and now we are welding our own from the Khartsyzsk pipe plant."

Azanov himself has been building gas pipelines for 20 years. The young people, Azanov believes are more dynamic and master the innovations more rapidly. The head of the section himself was sent to courses of gas electric welders, selected the fellows, and formed two Komsomol-youth brigades.

The pairs of welders are generally formed on the principle: one is more experienced the other is from the young people. A. Trofimov and V. Pirogov. Yu. Maloletov and N. Kopygin. One is in the pipe, the other is on the outside. Team after team, butt-joint after butt-joint, the gas pipeline becomes a length. From the very birth of gas welding, this work has been done by hand. But now a new step has been taken. The brigade of V. M. Leont'yev is mastering a unit which was developed in the Kiev Institute of Electric Arc Welding imeni Ye. O. Paton. Usually a brigade has 11-13 people, but for working with the youth unit they need half the number.

But now, unfortunately, complexities have developed in its manufacture. According to the words of the institute designers, the process of production of "Styk-1" is behind the project at the plant conveyor. Thus unfavorable criticism develops.

"We are very interested in this unit," says the head of the section. "If you have the opportunity, send my words to everyone on whom manufacture of 'Styk-1' depends."

It began to drizzle again. The combines again halted on the neighboring fields. Again the brigade foreman began to look to the horizon: was there not a clearing? No one goes home until dark. The welders conserved every minute. It can be no other way for brigades are on a contract. The brigade of B. Ye. Rudikov, for example, plans to finish fulfillment of the contract in September. Forty kilometers of trunkline have been assigned to it. By the way, this is almost the annual plan of the section.

"Honestly speaking," Azanov admitted, "I am no longer worried about this length. Now I am planning pipes and equipment for the next trunkline: Yelets-Kiev."

The section which now seems to be a wound, will soon disappear from the face of the earth. The next length of pipes of almost 1.5 m in diameter will be laid, the chernozem will be returned to its place, and next summer camomiles will again blossom. A deep river of gas will flow at a depth of three meters.

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SYNOPSIS OF ARTICLES IN 'CONSTRUCTION OF PIPELINES', APRIL 1982

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 4, Apr 82 pp 47-48

UDC 621.643/553.002.2+62.001.7

WORK BETTER, WORK MORE EFFICIENTLY

[Synopsis of article, pp 2-5]

[Text] The results of work of the sector in the first year of the 11th Five-Year Plan, task of the collectives of the ministry for fulfillment of the state plan of economic and social development of socialist commitments for 1982 and the 11th-year plan which were examined at an expanded meeting of the board of the Ministry of Construction of Oil and Gas Industry Enterprises are presented. The basic trends for solving the set tasks are indicated.

UDC 621.643.002.2+331.876.4

PATRONAGE OF THE KOMSOMOLS FOR THE MOST IMPORTANT CONSTRUCTION SITES

[Synopsis of article by A. P. Vesel'yev, pp 6-8]

[Text] The enormous national economic and political importance of the program for constructing gas transport systems from West Siberia to the center of the country is stressed. The weighty contribution of the Komsomols and young people to constructing the gas transport systems is noted. Recommendations are made for developing the patronage of the Lenin Komsomols over the central construction sites of the five-year plan. Specific measures are indicated for giving help to the construction site.

UDC 621.643:620.197.6

ALUMINUM COATINGS FOR PROTECTING HEAT NETWORKS FROM SOIL CORROSION

[Synopsis of article by M. V. Chizhevskiy, V. I. Pavlov, N. I. Semakin, et al., p 15]

[Text] It is shown that the main reason for the malfunctioning of thermal networks is the electrochemical corrosion of the outer surface of the pipes. Basic reasons are defined for corrosion destruction of pipelines. Data

are presented from laboratory tests and full-scale observations. Designs are suggested for units and technology for applying the aluminum coatings which make it possible to considerably increase the operating life of the heat networks. 1 illustration.

UDC 621.643:621.791/330.13

SELECTING THE CRITERION FOR EFFICIENCY OF WELDING-INSTALLATION OPERATIONS

[Synopsis of article by A. K. Moroz, pp 16-17]

[Text] It is noted that solution to the task of optimization of construction is characterized by high complexity. Different methods are described for approaching the solution to this problem. It is shown that the most efficient is evaluation of efficiency of welding-installation operations using the minimum adjusted outlays without consideration for the time factor. The presented evaluation of efficiency can be used both in planning and the process of constructing the pipeline.

UDC 621.643:620.197.6

EFFECT OF SURFACE TREATMENT OF METALS ON ADHESION PROPERTIES OF POLYMER COATING

[Synopsis of article by O. I. Chernikov, L. L. Mitrokhina, Yu. S. Vasil'yev, et al. pp 17-18]

[Text] It is shown that regulation of adhesion properties can be done by changing the surface energy of metal and the polymer coating. A design is suggested for the coating. Parameters are defined for the critical surface tension of wetting. Methods are presented for regulating the adhesion properties of polymers to the metals, of which the most promising is chemical treatments of the metal surface. 1 table.

UDC 621.643.002:12.001.24

PREDICTING THE DURATION OF CONSTRUCTION OF THE LINEAR PART OF MAIN PIPELINES

[Synopsis of article by L. G. Telegin, B. N. Furetin, V. N. Bessalov et al., pp 18-20]

[Text] A method is suggested for predicting the duration of construction based on statistical data for individual main pipelines. It is noted that the results of the forecast must not be the amount of time in a pure form, but the enlarged amount of labor-intensity. A technique and results are presented for calculating the values of parameters of the linear equation of regression. The duration of construction of the pipelines of different diameters is shown depending on the relative length of the route.

DETERMINATION OF THE LENGTH OF A STINGER IN LAYING UNDERWATER PIPELINE
FROM A BARGE-PIPELAYER

[Synopsis of article by T. N. Kiyasheyli, G. T. Abdullayev, D. R. Nazirova,
et al., pp 20-21]

[Text] An examination is made of the method of laying an underwater gas pipeline from a barge-pipelayer equipped with a system of stingers. An analysis is made of the stress-deformed state of the laid gas pipeline depending on the depth of laying, number of stingers and amount of thrust. A technique is suggested for selecting the optimal number of stingers and the amount of thrust for preventing an accident on the gas pipeline while laying. 1 illustration.

UDC 621.623.001.24

IMPROVEMENT IN THE DESIGN OF MULTIPLE-LAYER PIPES

[Synopsis of article by A. D. Dvoyris and G. M. Chichko, pp 21-24]

[Text] Note is taken of the features of multiple-layer pipes which have a negative effect on their efficiency. A design is suggested for a spirally-turned shell which guarantees normal efficiency of the pipe regardless of the lack of hermetic sealing of the inner layer. An example is presented for calculating the final static pressure acting on the inner and outer surfaces of the layers. It is shown that removal of the infiltrate through the broken outer seam prevents destruction of the multiple-layer pipes made of spiral-turned shells under conditions of a lack of hermetic sealing. 4 illustrations.

UDC 624.154.001.24

CALCULATION OF PILING FOUNDATIONS CONSTRUCTED ON FROZEN GROUND

[Synopsis of article by V. Ye. Poluektov and O. A. Rayskiy, pp 24-26]

[Text] Data are presented regarding tests of reinforced concrete piling-instruments by static and dynamic loads. It is established that the depth of fastening of the pilings in the ground under the influence of a static horizontal load depends on the amount of this load and on the depth of seasonal thawing of the ground and does not depend on the duration of the effect of the load. In calculating the pilings for the effect of dynamic of horizontal loads, the depth of fastening of the pilings should be assumed to be equal to the depth of seasonal thawed layer. 2 illustrations.

TRANSPORTING OF SUPERBLOCKS AT CONSTRUCTION SITES OF WEST SIBERIA

[Synopsis of article by I. Ya. Kastegayev, pp 27-28]

[Text] Examinations are made of the design of a device and the technology for fulfilling operations to transport superblocks weighing up to 400 T from the manufacturing plant to the site of installation on the foundation. Advantages are shown of the set of suspended equipment on an air cushion which makes it possible to reduce the transportation expenditures and improve the quality of the work done. 2 illustrations.

UDC 621.643/621/315.6

USE OF FOAM PLASTIC FPB FOR THERMAL INSULATION OF PIPELINES

[Synopsis of article by Ye. V. Antonova and B. I. Stefurak, pp 29-30]

[Text] A description is made of the technology for applying foam plastic of brand FPB to pipelines used by the trust "Tyumengazmontazh." The economic effect from using the pipelines insulated with FPB as compared to using bitumen claydite is R 1 million. 2 illustrations.

UDC 621.643.001.24

DETERMINATION OF LOADS INFLUENCING PIPELAYERS IN LAYING PIPELINES

[Synopsis of article by Yu. A. Dudoladov and V. G. Sharonov, pp. 37-38]

[Text] An algorithm is developed, analytically and practically verified which takes into consideration the comparability of the bending rigidity of the pipeline and the rigidity of its supports which makes it possible to calculate more reliably the stresses developing on the boom of the pipelayers. It is expedient to use the method in calculating pipelines made of concretized, multiple layer pipes and pipes with thick walls.

PIPELINES

SYNOPSIS OF ARTICLES IN 'CONSTRUCTION OF PIPELINES', MAY 1982

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 5, May 82

UDC 621.643.002.2+331.876.4

INTENSIVE FRONT OF THE FIVE-YEAR PLAN

[Synopsis of article pp 2-3]

[Text] An examination is made of the socialist competition at the central pipeline construction sites of the Five-Year Plan, competition in honor of 1 May, as well as participation of the collectives of the Ministry of Construction of Oil and Gas Industry Enterprises in the movement for a worthy meeting of the 60th anniversary of the formation of the USSR. Tasks are covered of the trade union organizations in the sector to improve efficiency in quality of construction, improve working and living conditions of the builders.

UDC 621.643/553.002.2+658.5

TASKS OF INTRODUCING SCIENTIFIC ORGANIZATION OF LABOR

[Synopsis of article by N. P. Firsa, pp 9-10]

[Text] The need is shown for changing the zone of servicing of construction organizations of the scientific research station of the center of scientific organization of labor "Neftegazstroytrud." Measures are presented which are aimed at expanding the sphere of introduction of scientific organization of labor. Basic trends for improving the economic mechanism in line construction adopted for the Center of Scientific Organization of Labor and the Scientific Research Center for the 11th Five-Year Plan are presented.

OPTIMIZED SOLUTIONS OF SURFACE OBJECTS

[Synopsis of article by N. M. Belkin and M. G. Taygunov, pp 11-12]

[Text] Descriptions are provided for new planning solutions for compressor stations which guarantee drastic reduction in the total outlays for their construction. The volumetric-planning solutions are based on schemes of the general plans of the compressor station with units GTU-10, GTK-10-4. The identity of schemes of general plans is attained by a new design of the shop with units GTK-10-4 without service auxiliary additions. It is shown that the next stage in developing the industrial solutions to compressor station facilities must be the creation of projects for compressor shops in individual coverings for all types of GPA.

UDC 621.643.002.2(571.1)

CRITERIA FOR EFFICIENCY OF ANCHOR DEVICES IN PIPELINE CONSTRUCTION

[Synopsis of article by A. K. Arabskiy and V. V. Postnikov, pp 17-18]

[Text] An examination is made of the relationship between the volume of ground operations and overall dimensions of ground anchors. An analysis is made of the interrelationship of the power of machines for submerging anchors with their overall dimensions. The influence of overall dimensions of the anchor devices on the outlays of materials for their manufacture is determined. Based on the derived relationships, criteria are defined for the efficiency of anchor devices. 2 illustrations.

UDC 621.643.002.2/502.7

EFFICIENCY OF ENVIRONMENTAL PROTECTION MEASURES IN CONSTRUCTING MAIN PIPELINES

[Synopsis of article by I. P. Novikov and L. D. Shor, pp 19-21]

[Text] An analysis is made of different aspects of comprehensive measures for environmental protection in construction of main pipelines. It is noted that at the stage of planning it is necessary to use more widely the materials of aerial photography and special maps for the conditions of construction. The need is shown for developing special environmental protection measures, substantiation of the volumes of capital outlays for conducting them, the expediency of determining the percentage participation of the related departments in construction and operation of facilities promoting protection of the environment. 3 illustrations.

LARGE COMPREHENSIVE LINES, THE BASIS FOR HIGH-SPEED CONSTRUCTION
OF MAIN GAS PIPELINES

[Synopsis of article by V. I. Gushchin, pp 23-26]

[Text] A detailed examination is made of the structure of a large comprehensive line in the Transcaucasus administration of pipeline construction which during 1980-1981 guaranteed construction of 140 km of pipelines of large diameter. Organizational principles and technology for fulfilling the work are described. Data are presented on the number of workers in the line, machine supply, fund equipping of the work of the builders. The national economic effect from high-speed construction of gas pipelines is defined. 2 illustrations.

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CSO: 1822/270

PIPELINES

SYNOPSIS OF ARTICLES IN 'CONSTRUCTION OF PIPELINE', JULY 1982

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 7, Jul 82 p 32

UDC 621.643/553.002.2+62.001.7

PROGRAM FOR IMPROVING THE LEVEL OF INTENSIFICATION AND EFFICIENCY OF
THE CONSTRUCTION INDUSTRY

[Synopsis of article by B. Ye. Shcherbina, pp 2-7]

[Text] Tasks are covered of the sector in light of the decree of the CPSU Central Committee "Work of the Ministry of Construction of Oil and Gas Industry Enterprises for Mechanical Re-equipping and Introduction of Progressive Methods of the Construction Industry." Basic conclusions of the sector program are examined in the area of mechanization and automation of production processes for building the line section of main pipelines, surface objects of oil and gas industry. A lot of attention is focused on questions of improving the quality of construction, development of new types of pipeline transport. Tasks are defined for the sector to improve organization and control of construction, and social development of production collectives.

UDC 331.875.1.004.67

IMPROVEMENT IN THE USE AND REPAIR SUPPORT OF EQUIPMENT. A MOST IMPORTANT
TASK OF ORGANIZATIONS AND ENTERPRISES IN THE SECTOR

[Synopsis of article by G. A. Arendt, pp 10-11]

[Text] The growth in power available per productive worker is shown in the oil and gas construction. The available reserves for improving the use of equipment are examined. Progressive methods are presented for repair support requiring broad dissemination. It is shown that fulfillment of the presented measures for further improvement of the use and repair support of equipment will promote a growth in efficiency of construction.

CREATION OF NEW EQUIPMENT FOR RE-EQUIPPING THE SECTOR

[Synopsis of article by Ye. P. Kovalev, pp 12-14]

[Text] A description is provided for machines, mechanisms and equipment currently used for construction of pipelines of diameter 1420 mm designed for working pressure of 7.5 MPa. The need is shown for further improvement in the design of machines. New developments are examined for creating swamp-going equipment, excavating and insulation-laying machines.

UDC 621.643:621.791

WAYS TO IMPROVE THE LEVEL OF MECHANIZATION OF WELDING OPERATIONS IN BUILDING PIPELINES

[Synopsis of article by O. M. Serafin and Yu. F. Losev, pp 14-16]

[Text] Basic measures are examined which have been taken by the Ministry of Construction of Oil and Gas Industry Enterprises to reduce labor intensity of welding-installations, mechanization and automation of welding operations for construction of the line part of main pipelines. Design features of the units are described for electric-contact and automatic welding of butt-joints of pipes by powder wire. Technology and organization of welding-installation operations are presented with the help of complexes "Sever-1" "Styk." Problems are examined of welding thick-walled pipes in field construction. Paths are outlined for improving the technological readiness of the welding equipment, measures for training the welders and operators to work on the new equipment.

UDC 621.643/553.002.2+62.001.7

SCIENTISTS OF THE VUZ-SECTOR

[Synopsis of article by V. L. Beregin, pp 18-20]

[Text] The basic aspect of cooperation between the Moscow Institute of Petrochemical and Gas Industry imeni Academician I. M. Gubkin and the organizations of the Ministry of Construction of Oil and Gas Industry Enterprises is aimed at accelerating scientific-technical progress in the oil and gas construction. New methods are examined of excavating-laying operations, ballasting and fastening pipelines on swamps. The possibility is shown of constructing junctions of pipelines under roads by the method of horizontal vibration-impact tunneling, piling operations by the method of impact pumping. Results are presented of a number of studies in the area of organizing construction, automated planning and other developments.

INTRODUCTION OF SET-BLOCK METHOD AT SIBERIAN CONSTRUCTION SITES

[Synopsis of article by V. P. Smirenko, p 21]

[Text] Basic measures are presented for organizational-technological preparation of production fulfilled by the trust Orgtekhstroy at facilities of the association "Sivkomplektmontazh." The introduction of a computer into the practice of controlling construction, methods of combined assembly of enlarged assemblies of technological pipelines, transportation plans for shipping freight, creation of resources of mechanization and automation of labor-intensive processes are examined. Measures are covered which are conducted by the trust for propaganda of the leading production experience.

UDC 624.09.073-412/658.5

IMPROVE ORGANIZATION OF CONSTRUCTION OF SET-BLOCK FACILITIES

[Synopsis of article by S. M. Sivash, pp 22-23]

[Text] A system is presented for organization of construction production for erecting objects of the oil and gas industry in the set-block design. The value of the technological specialization of construction-installation organizations, introduction of the method of brigade contract which is an important factor for improving labor productivity and efficient use of work time is noted. The suggested structure of control of construction of the object is presented and the rules and duties of the contractors are examined.

UDC 69.033/656.073

SELECTION OF TRANSPORTATION VEHICLES FOR SHIPPING LARGE-SIZED BLOCK-SET DEVICES

[Synopsis of article by G. V. Rastorguyev, pp 23-24]

[Text] Basic plans are presented for shipping block-set devices to the site of installation by water and truck transport. Basic designs are presented for the working part of the transportation vehicles. It is noted that the use of caterpillar-track transport devices makes it possible to reduce the specific pressures on the ground to 0.1 MPa. The need is shown for orienting the designers on creation of vehicles capable of fulfilling not only transportation, but also loading-unloading operations.

COMBAT TASKS OF THE YOUNG BUILDERS

[Synopsis of article by D. S. Shokin, pp 24-26]

[Text] Materials are generalized from the 19th Komsomol Congress on questions of patronage of the Komsomol of the most important construction sites in the five year plan. The great contribution of the young builders of the Ministry of Construction of Oil and Gas Industry Enterprises to fulfillment of the fuel and energy program of the country is noted. Especial attention is focused on the practice of the Lenin Komsomol to form all-union shock worker teams and their sending to the shock-worker construction sites. The experience of work of the Komsomol-youth collectives from the trust Urengoy-Gazstroy, Severgazstroy, Tyumengazmontazh, Megiongazstroy, and the association "Sivkomplektmontazh" is covered. The outlook for participation of the Komsomols and young people in constructing the central construction sites of the five-year plan, the West Siberia-center of the country system of gas pipelines is outlined.

UDC 621.643.002.2(571.1)+331.876.4

BY A COURSE OF INTENSIFICATION

[Synopsis of article by N. I. Kurbatov, pp 27-28]

[Text] The contribution of Glavsibtruboprobodstroy to implementation of the country's energy program is noted. The outlook for development of production facilities of the central board for successful fulfillment of the increased volumes of pipeline construction in West Siberia are outlined. Specific organizational and technological measures are presented which promote improvement of the quality of the work done, decrease in its labor intensity. Attention is focused of the contribution of the leading production collectives to solving primary tasks of the sector.

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